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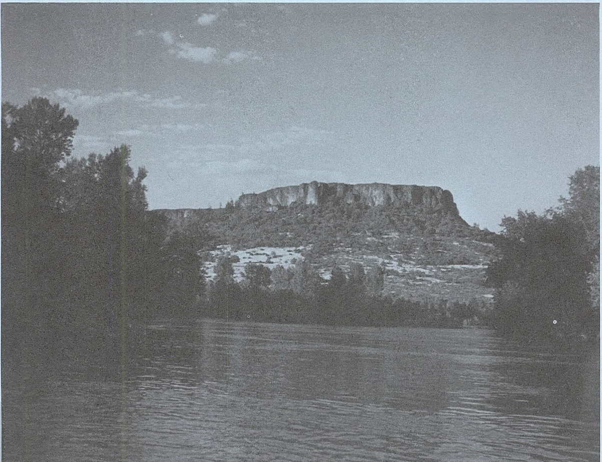
October 1994

Medford District Proposed Resource Management Plan/ Environmental Impact Statement

Volume I



As the Nation's principal conservation agency, the Department of the Interior has responsibility for most of our nationally owned public lands and natural resources. This includes fostering the wisest use of our land and water resources, protecting our fish and wildlife, preserving the environmental and cultural values of our national parks and historical places, and providing for the enjoyment of life through outdoor recreation. The Department assesses our energy and mineral resources and works to assure that their development is in the best interest of all our people. The Department also has a major responsibility for American Indian reservation communities and for people who live in Island Territories under U.S. administration.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT
Medford District Office
3040 Biddle Road
Medford, Oregon 97504

TAKE PRIDE IN AMERICA

IN REPLY REFER TO:
1617 (933)

October 1994

Dear Reader:

Enclosed for your review and comment is the Medford District Proposed Resource Management Plan and Final Environmental Impact Statement (PRMP/FEIS). The PRMP/FEIS covers the Medford District planning area located in southwestern Oregon. The Bureau of Land Management has prepared this document in partial fulfillment of its responsibilities under the Federal Land Management and Policy Act of 1976 and the National Environmental Policy Act of 1969.

The Proposed RMP/Final EIS is designed to be used in conjunction with the Draft RMP/EIS published in August 1992. Reviewers may find it useful to refer to both the Draft RMP/EIS, and to the Record Of Decision (ROD) on the Final Supplemental Environmental Impact Statement on Management of Habitat for Species Within the Range of the Northern Spotted Owl (FSEIS) which was published April 1994.

The Preferred Alternative in the Draft RMP/EIS has been renamed the Proposed Resource Management Plan (PRMP). The Preferred Alternative (PA) in the Draft RMP has been revised as a result of public comments, internal review, and the Record of Decision on the FSEIS. Many of the appendices published in the Draft RMP/EIS were not reprinted in this document.

The PRMP also includes Alternative 9, as described in the ROD on the FSEIS for the Management of Habitat for Species Within the Range of the Northern Spotted Owl and in reference is incorporated into this PRMP. To the extent possible, FSEIS ROD decisions have been made district specific.

The Medford District received more than 1,400 individual comment letters containing over 3,070 substantive comments. The Planning Team assessed these comments and utilized the input in making substantive changes in the Proposed RMP and strengthening the FEIS. We sincerely appreciate the efforts of those who took the time to provide us with these comments. We feel your comments have resulted in a stronger and clearer PRMP.

The Proposed RMP/Final EIS contains a summary comparison of the alternatives considered (including the PRMP), an introduction, the PRMP together with other alternatives not selected, a description of the affected environment, a description of the environmental consequences of implementing the PRMP or one of the other alternatives, a list of people or organizations commenting on the Draft, and the Bureau's response to those comments. If you desire assistance in understanding this document, you may contact RMP Team Leader Jim Keeton at (503) 770-2263.

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Public briefings on the Proposed Resource Management Plan/Final Environmental Impact Statement will be held in Medford at the BLM District Office at 3040 Biddle Road and in Grants Pass at the Fairgrounds Pavilion Room in December 1994. Both meetings will start at 7:00 P.M. and extend to 9:00 P.M. The purpose of the meetings is to explain the PRMP/FEIS and to answer relevant questions.

If you would like further consideration of your interest/concerns prior to the final decision is made that will guide the management of public lands in the planning area for the next 10-15 years, please identify them in writing prior to the end of the 30 day comment period. The comment period will be 30 days after the Notice of Availability is published in the Federal Register. Comments should be sent to:

District Manager (110)
Bureau of Land Management
Medford District Office
3040 Biddle Road
Medford, OR 97504

The final decision will be based on the analysis contained in the EIS, additional data available, public input, management feasibility, and policy and legal constraints. Approval of the plan will be documented in a Record of Decision that will be made available to the public and mailed to all parties that received this document. It is also important to note that RMP implementation usually involves further analysis and decision making, including public involvement and allows for appeal/protest of decisions under 43 CFR Parts 4 and 5000.

The resource management planning process includes an opportunity for administrative review via a plan protest to the BLM Director if you believe the approval of a Proposed RMP would be in error under 43 CFR 1610.5-2. Careful adherence to those guidelines will assist in preparing a protest that will assure the greatest consideration to your point of view.

Only those persons or organizations who participated in our planning process leading to this Proposed RMP may protest. If our records do not indicate that you had any involvement in any stage in the preparation of the Medford District Proposed RMP, your protest will be dismissed without further review. A protest must also be limited to a single district Proposed RMP, even if the issue or concern involves more than one Proposed RMP. Protests that challenge proposed decisions in more than one of the six Proposed western Oregon RMPs, will not be accepted by the Director. In effect, if you may be adversely affected by more than one RMP, you must file an individual protest for each district RMP citing why and where that particular RMP is incorrect or not in compliance with existing laws, regulations, etc.

Protests of proposed plan elements that merely adopt decisions made in the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl signed by the Secretary of the Interior will be dismissed, as the Director has no authority to overrule those decisions which the Secretary has already directed to be adopted in BLM's new resource management plans.

Before deciding to file a protest, I encourage you to contact me or Jim Keeton to determine if your concerns might be met in some way other than via a protest or to assist you in the protest process if it is appropriate.

A protesting party may raise only those issues which he or she submitted for the record during the planning process. New issues identified during the protest period should be directed to the District Manager for consideration during plan implementation, as potential plan amendments, or as otherwise appropriate. If an issue is shared by several individuals or landowners or interest groups, a combined protest on the common neighborhood issue or concern may be mutually more efficient and effective.

The period for filing a plan protest begins when the Environmental Protection Agency publishes in the Federal Register its Notice of Availability of the Final Environmental Impact Statement concerning the Proposed RMP. The protest period extends for 30-days. There is no provision in BLM's regulations for an extension of time. To be considered "timely," your protest must be postmarked no later than the last day of the protest period. Although not a requirement, we suggest that you send your protest by certified mail, return receipt requested.

Protests must be filed in writing to:

Director (760)
Chief, Planning and Environmental Coordination
Bureau of Land Management
406 "L" Street
Washington, D.C. 20240

In order to be considered complete, your protest must contain, at a minimum, the following information:

(1) The name, mailing address, telephone number, and issue/concern of the person filing the protest.

(2) A statement of the issue(s)/concern(s) being protested.

(3) A statement of the specific part or parts of the Medford District PRMP being protested. To the extent possible, this should reference specific pages, paragraphs, sections, tables, maps, etc.

(4) A copy of all documents addressing the issue(s)/concern(s) that you submitted during the planning process or a reference to the date when you discussed the issue(s)/concern(s) for the record.

(5) A concise statement explaining why you believe the BLM State Director's decision is incorrect. This is a critical part of your protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents, environmental analysis documents, available planning records (i.e., meeting minutes or summaries, correspondence, etc.). A protest which merely expresses disagreement with the Oregon/Washington State Director's proposed decision, without any data , will not provide us with the benefit of your information and insight. In this case, the Director's review will be based on the existing analysis and supporting data.

Thank you for your continued interests in the multiple use management of your public lands.

Sincerely,

David A. Jones

David A. Jones,
District Manager

U. S. Department of the Interior
Bureau of Land Management

MEDFORD DISTRICT PROPOSED RESOURCE MANAGEMENT PLAN

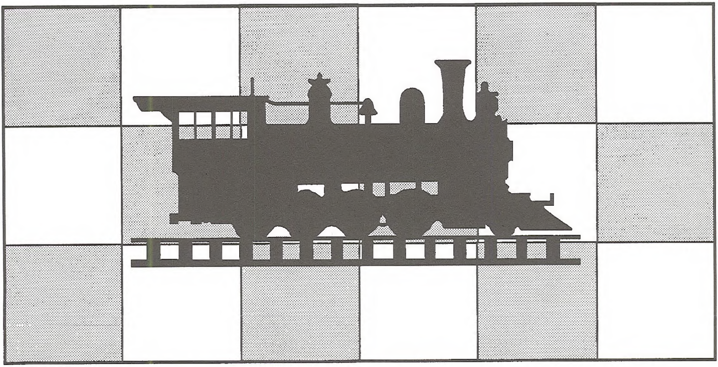
and

Final Environmental Impact Statement

Prepared by
Medford District Office
September 1994

Elaine Y. Zielinski
State Director, Oregon/Washington

David A. Jones
District Manager, Medford District



MEDFORD DISTRICT
PROPOSED RESOURCE MANAGEMENT PLAN
and
FINAL ENVIRONMENTAL IMPACT STATEMENT

Department of the Interior
Bureau of Land Management
Medford District

1. Type of Action: Administrative (X) Legislative ( )

2. Abstract: This Proposed Resource Management Plan and Final Environmental Impact Statement, in combination with the Draft, addresses management of some 859,100 acres of public land surface and 4,700 acres of subsurface federal mineral estate administered by the Bureau of Land Management in the Medford District, Oregon. Seven alternatives, including a No Action Alternative (no change from the current plan), are analyzed. These alternatives range in emphases from production of timber resources and other commodity values to management and enhancement of values such as biological diversity, northern spotted owl habitat, old growth forest, dispersed recreation opportunities, areas of critical environmental concern, and scenic resources. The Proposed Resource Management Plan responds to the need for a healthy forest ecosystem with habitat that will support native species (particularly those associated with late-successional and old growth forest) and includes protection for riparian areas and waters. It also responds to the need for a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies, and contribute valuable resources to the national economy, on a predictable and long-term basis. Twenty-five new areas of critical environmental concern will be designated and four additional rivers segments are found suitable for designation under the Wild and Scenic River Act.

3. Comment/Protest Period: The protest and comment period will end 30 days after the Environmental Protection Agency publishes its Notice of Availability in the Federal Register.

4. For further information contact:

Jim Keeton
RMP/EIS Team Leader
Bureau of Land Management
3040 Biddle Road
Medford, OR 97504
(503) 770-2200

User's Guide

The Proposed Resource Management Plan and Final Environmental Impact Statement (PRMP/FEIS) is divided into seven major sections: The Summary, Chapter 1 - Introduction, Chapter 2 - Alternatives, Chapter 3 - Affected Environment, Chapter 4 - Environmental Consequences, Chapter 5 - Consultation and Coordination, and supporting materials or appendices. Also included is a map packet which binds the one- and two-page maps. The larger foldout maps are included in a shrink wrap package. These major portions of the PRMP/FEIS are explained below.

The **Summary** presents a synopsis of the PRMP/FEIS. It follows the same outline as that in the Draft but has been updated to reflect changes made in the PRMP/FEIS. It summarizes all alternatives but presents more detail for the PRMP. Land use allocations are summarized for all issues in narrative and table form (see Table S-1). A summary of the environmental consequences (see Table S-2) and brief descriptions of monitoring, consistency with other government entities, and public involvement are included.

Chapter 1 (Introduction) contains introductory material to the PRMP/FEIS. This chapter remains essentially the same as that presented in the Draft RMP and includes a description of the planning area and the purpose and need for preparing the RMP/EIS. Of major importance, it identifies the issues or concerns addressed in the RMP/EIS process. A discussion of the RMP's relationship to BLM policies, programs and other plans, a description of the planning process, and planning criteria are included.

Chapter 2 (Description of the Alternatives) has been extensively revised, both from an organizational standpoint and how proposed decisions are described. The Preferred Alternative (PA) from the Draft RMP has been revised based on public comments, internal review, and incorporates Alternative 9 from the SEIS ROD. The PA has been renamed the Proposed Resource Management Plan (PRMP). Chapter 2 can be divided into three major sections:

- First, the Proposed Resource Management Plan is described in terms of: a) major land use allocations, and b) resource specific guidance. Each of these is further subdivided by objectives, land use allocations, and management actions/direction specific to the PRMP.
- Second, management direction common to Alternatives NA-E, followed by those alternatives. This section has been modified very little.
- Third, presentations located near the end of Chapter 2 (e.g., Use of the Completed Plan, Adaptive Management, Watershed Analysis, etc.) apply to all alternatives but were specifically written for the PRMP.

As in the Draft RMP, Chapter 2 describes seven different alternatives that respond to the 11 issues identified in Chapter 1. The alternatives provide a mix of uses and actions that could resolve the issues. Maps depicting the various proposed decisions for the PRMP have been updated and clarified and are located in the map packet. Maps displaying the major land use allocations for Alternatives A-E have not been reproduced.

Chapter 3 (Affected Environment) describes the environment that could be affected or changed by implementing any of the alternatives. Chapter 3 has been updated to reflect new data or to clarify information based upon comments. This chapter includes a description of the environmental factors (water resources, vegetation, wildlife habitat, visual resources, etc.) related to the issues.

Chapter 4 (Environmental Consequences) describes potential impacts and changes to the affected environment if any of the alternatives were implemented. This chapter has been updated primarily to reflect changes made to the PRMP and to reference impact analysis from the FSEIS where appropriate. A discussion regarding consistency with other federal agencies, state and local governments, and Indian tribes is also included.

Chapter 5 (Consultation and Coordination) identifies agencies and organizations BLM has worked with during the preparation of the PRMP/FEIS. This chapter has been significantly modified. It includes an updated summary of public involvement activities, a list of agencies and organizations to whom copies of the PRMP/FEIS have been sent, the list of preparers, and a description of protest procedures.

The **Appendices** contain supplemental or backup information usually of a technical nature. The number of appendices included in the PRMP/FEIS has been substantially reduced from that included in the Draft RMP. Appendices relating to the Affected Environment or Environmental Consequences were not reproduced if they did not change or if they were no longer relevant.

Other Specific Guidance

There are a number of other sections of the PRMP/FEIS that could enhance your understanding of this long, complex, and hard to read document.

The **Table of Contents** is located at the beginning of this document. It is very detailed and can be used to locate most sections. The Table of Contents not only contains a chapter by chapter list of topics but also includes lists of maps, figures, tables, and appendices.

The **List of Acronyms** is located at the beginning of this document. Acronyms are used throughout this document and their use had been reduced for the readers convenience.

The **Glossary** is located at the end of this volume and is essential to understanding many of the technical terminology and phrases used throughout the plan.

A **Summary of Major Changes** is located at the start of each chapter that documents those important changes to the Draft RMP/EIS, which have been incorporated into this PRMP/FEIS.

Maps. The shrink-wrapped maps depict allocations for the PRMP. The separately bound map packet contains all one and two-page maps. Maps illustrating allocations for the other alternatives were not reprinted; refer to the Draft RMP for this information.

Acronyms

ACEC	Area of Critical Environmental Concern
ACOE	Army Corps of Engineers
AMA	Adaptive Management Area
AMS	Analysis of the Management Situation
ARD	Automated Resource Data
ARPA	Archeological Resources Protection Act
AUM	Animal Unit Month
BLM	Bureau of Land Management
BMP	Best Management Practices
BRU	Basic Resource Unit
CEQ	Council on Environmental Quality
CFI	Continuous Forest Inventory
CFR	Code of Federal Regulations
CMAI	Culmination of Mean Annual Increment
CRMP	Coordinated Resource Management Plan
CSU	Controlled Surface Use
CWD	Coarse Woody Debris
DBH	Diameter at Breast Height
DCA	Designated Conservation Area
DEQ	Oregon Department of Environmental Quality
EA	Environmental Assessment
ECA	Equivalent Clearcut Area
EEA	Environmental Education Area
EIS	Environmental Impact Statement
ESA	Endangered Species Act
ESC	Existing Stand Condition
FEIS	Final Environmental Impact Statement
FIR	Forest Intensified Research
FLPMA	Federal Land Policy and Management Act
GFMA	General Forest Management Area
GIS	Geographic Information System
HCA	Habitat Conservation Area
HIM	High Intensity Management
IFMP	Intensive Forest Management Practices
ISA	Instant Study Area
LCDC	Land Conservation and Development Commission
LIM	Low Intensity Management
LUA	Land Use Allocation
LSR	Late-Successional Reserve
MFP	Management Framework Plan
MMBF	Million Board Feet
MMCF	Million Cubic Feet
MPA	Managed Pair Area
MTP	Master Title Plats
N/A	Not Applicable
NA	No Action
NEPA	National Environmental Policy Act
NPV	No Present Value
NSO	Northern Spotted Owl
NSO	No Surface Occupancy
NWSRS	National Wild and Scenic Rivers System
O&C	Oregon and California (revested lands)
ODFW	Oregon Department of Fish and Wildlife
OGEA	Old Growth Emphasis Area
OHV	Off-Highway Vehicle
OI	Operations Inventory
ONA	Outstanding Natural Area
ORV	Outstandingly Remarkable Value
OWRD	Oregon Water Resources Department
OSHA	Occupational Safety and Health Administration
OSMP	Oregon Smoke Management Plan
OSO	Oregon State Office
PA	Preferred Alternative
PCT	Pacific Crest Trail
PCT	Precommercial Thinning
PD	Public Domain
PILT	Payment in Lieu of Taxes
PM	Particulate Matter
PNV	Present Net Value
PP&L	Pacific Power and Light
PRMP	Proposed Resource Management Plan
PSC	Power Site Classification
PSQ	Probable Sale Quantity
QMA	Quality Management Area
R&PP	Recreation and Public Purposes
R&R	Restoration and Retention
RA	Resource Area
RAMP	Recreation Area Management Plan
RHA	Residual Habitat Area
RIA	Rural Interface Area
RMA	Riparian Management Areas
RMP	Resource Management Plan
RNA	Research Natural Area
ROD	Record of Decision
RPS	Rangeland Program Summary
SCFL	Suitable Commercial Forestland
SIP	State Implementation Plan
SOMA	Spotted Owl Management Area
SRMA	Special Recreation Management Areas
SYU	Sustained Yield Units
T&E	Threatened and Endangered
TPCC	Timber Production Capability Classification
USDA	United States Department of Agriculture
USDI	United States Department of the Interior
USF&WS	U.S. Fish and Wildlife Service
VRM	Visual Resource Management
W&SR	Wild and Scenic River
WODDB	Western Oregon Digital Database
WSA	Wilderness Study Area

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PRMP/FEIS Summary

Summary of Major Changes

The Proposed Resource Management Plan (PRMP), which is consistent with the SEIS ROD, replaces the Draft RMP Preferred Alternative (PA).

Introduction

The Summary provides a brief overview of the alternatives and impacts associated with implementing any of the alternatives. This section is required by the National Environmental Policy Act. While there is a brief explanation of all alternatives described in detail, the majority of this section summarizes the Proposed Resource Management Plan (PRMP). Table S-1 is a summary comparison of allocations and management actions by alternative. Major allocations from the Preferred Alternative of the Draft RMP/EIS are presented only in Table S-1 and only for comparative purposes. Table S-2 summarizes environmental consequences by alternative.

The Medford District Resource Management Plan (RMP) will establish land use allocations and management guidelines for the management of BLM-administered land in the Medford District for at least the next ten years. It will supersede and replace the Josephine and Jackson/Klamath Management Framework Plans (MFPs), as amended, covering the same general area. The PRMP/FEIS has been prepared in accordance with the BLM planning regulations issued under authority of the Federal Land Policy and Management Act (FLPMA), and written in accordance with Council on Environmental Quality (CEQ) regulations issued under authority of the National Environmental Policy Act (NEPA).

There are approximately 859,100 acres of BLM-administered land in the planning area, of which 749,500 acres are revested Oregon and California (O&C) grant land, 97,000 acres are public domain (PD) land, 12,600 acres are land within the Rogue National Wild and Scenic River, and 4,700 acres are split estate (nonfederal surface/federal minerals). This does not include 8,900 acres of BLM lands within the Wild Rogue Wilderness that are now administered by the Siskiyou National Forest.

Alternatives

Seven alternatives have been developed to provide a range of responses to the 11 major issues identified earlier in the planning process. These issues are: timber production practices; old growth forests; habitat diversity; threatened and endangered species habitat; special areas; visual resources; stream, riparian, and water quality protection; recreation resources, including wild and scenic rivers; land tenure; and rural interface areas. Of particular interest is whether or not to harvest the remaining old growth forests and the related effects harvest could have on regional and local economies, biological diversity, and the northern spotted owl, a federal listed threatened species.

Each alternative offers a possible broad course of action that, if selected, would provide land use allocations and management guidelines for future, more specific decisions. Site-specific management for various resources; annual timber sale plans; and issuance of rights-of-way, leases, or permits will follow the direction and guidelines identified in the PRMP.

Selected land use or resource allocations of the alternatives are compared in Table S-1. Analysis of effects of each alternative, except the No Action (NA) Alternative, have been facilitated by development of 10-year representative timber management scenarios. These scenarios (designed only for analytic purposes) reflect possible timber harvest units, road locations, and timber management practices. The scenarios include different levels of forest management practices. Anticipated environmental consequences of the alternatives are summarized in Table S-2.

A summary of the No Action Alternative, Alternatives A, B, C, D, E, and the Proposed Resource Management Plan follows. Maps of Alternatives NA-E and the Preferred Alternative from the Draft are not reproduced in this document. If you received only this Summary, rather than the full PRMP/FEIS, only the Proposed Resource Management Plan Strategy maps are enclosed.

No Action

This alternative would entail no change from the management direction established in BLM's current management framework plans (MFPs), as amended (except where Congress has since enacted legislation prescribing different management direction for specific geographic areas or transferring specific lands to the administration or ownership of other parties).

This alternative would emphasize a high level of timber production and other economically important resources. Most suitable commercial forestland on both O&C and PD lands would be available for timber management. Timber allocations would be based on the 1977 timber suitability inventory (458,000 acres) rather than the new inventory of 558,900 acres of suitable commercial forestland. Habitat of federal listed and proposed threatened and endangered species would be managed as legally required. Approximately 3,000 acres of old growth would be allocated to provide habitat for 14 spotted owl management areas (SOMAs). Limited protection consistent with the Oregon Forest Practices Act and the Federal Water Pollution Control Act would be provided to water resources and riparian values. All existing special areas (3 areas of critical environmental concern (ACEC), 2 research natural areas (RNA), and 3 environmental emphasis areas (EEA)) would be retained. No new rivers would be found suitable for wild and scenic river designation. Recreation management would provide for a wide range of developed and dispersed recreation uses. The existing recreation sites and trails, special recreation management areas, and back country byways would be maintained. No special resource management practices would be applied in rural interface areas (RIAs).

Alternative A

This alternative would emphasize a high level of timber production and other economically important resources. Most suitable commercial forestland including woodlands would be available for timber management. Habitats of federal listed and proposed threatened and endangered species would be managed as legally required. Water quality, wetlands, anadromous fish habitat, and riparian values would be managed and protected in accordance with the Oregon Forest Practices Act, the Federal Water Pollution Control Act (as amended), and best management practices (BMPs).

Scenic resources would be maintained on lands not available for timber management. Upper and Lower Table Rocks ACEC and outstanding natural area (ONA) would be retained. Recreation management emphasis would be on existing recreation sites and trails of high use and dispersed motorized recreation uses. No special resource management practices would be applied in RIAs.

Alternative B

This alternative would also emphasize a high level of timber production and other economically important resources. Most suitable commercial forestland including woodlands on O&C lands would be available for timber management. PD lands would be managed for a variety of natural resources but would not place a primary emphasis on timber production. Blocks of old growth and mature forest distributed by seed zone, elevation, and major plant group would be retained to contribute to ecological functions important to timber productivity.

Habitats of federal listed and threatened and endangered species and species proposed for such status would be protected. Other special status species would be protected to the extent consistent with high timber production. Candidate species found only on BLM-administered land would be protected. Riparian values would receive greater protection on larger streams through wider riparian management area (RMA) protection. RMA widths recognize the diversity of species associated with riparian areas consistent with the emphasis on biological diversity. All existing ACECs would be retained and one new one designated. No new rivers would be found suitable for wild and scenic river designation. Scenic resources would be maintained on lands not available for timber management and/or adjacent to recreation areas, highways, and state scenic waterways. Recreation management would provide for a wide range of developed and dispersed recreation uses. Special resource management practices would be applied in RIAs, which include lands zoned for 1-5 acre residential lots.

Alternative C

This alternative would emphasize retention and improvement of biological diversity. Forest management would be based on a system that manages for and retains some old growth and mature forest, manages for connectivity, and incorporates protection of areas where special status plants and animals species are clustered.

Habitats of federal listed and threatened and endangered species and species proposed for such status would be protected. Other special status species would be protected primarily through the emphasis on biological diversity. Candidate species found only on BLM-administered land would be protected. Riparian values would be protected on all perennial streams or those with beneficial uses. RMA widths recognize the diversity of species that are associated with riparian areas consistent with the emphasis on biological diversity. All existing ACECs would be retained and 18 new ones would be designated. No new rivers would be found suitable for wild and scenic river designation. Scenic resources would be maintained on lands not available for timber management and/or adjacent to recreation areas, highways, state scenic waterways, and where BLM-administered land makes up more than half of a viewshed. Recreation management would provide for a wide range of recreation opportunities, emphasizing dispersed use. Special resource management practices would be applied in RIAs, which include lands zoned for 1-20 acre residential lots.

Alternative D

This alternative would emphasize management and enhancement of a variety of resource values. Northern spotted owl habitat would be managed in accordance with the Conservation Strategy for the Northern Spotted Owl, setting aside approximately 25 percent of the planning area as habitat conservation areas (HCAs) and managing the remaining forestland to retain dispersal habitat.

Habitats for all other federal listed, proposed and candidate threatened and endangered species, state listed, and Bureau-sensitive species would be managed to support the conservation and protection of these species. Riparian values would be protected on all perennial streams or those with beneficial uses. RMA widths recognize the diversity of species that are associated with riparian areas and also provide protection for some smaller streams. All existing ACECs would be retained and 21 new ones designated. One river would be found suitable for designation as a wild component of the wild and scenic river system. All identified scenic resources would be maintained. Recreation management would emphasize dispersed nonmotorized opportunities. Special resource management practices would be applied in RIAs, which include lands zoned for 1-20 acre residential lots. Some management activities would not be allowed, and scenic quality would be managed to meet VRM Class II objectives in RIAs.

Alternative E

This alternative would emphasize protection of older forests and management and enhancement of values such as dispersed nonmotorized recreation opportunities and scenic resources. Many commercial forestlands would be unavailable for timber management and sustained yield of timber would be low. All forest stands over 150 years old would be retained.

Habitats for all federal listed, proposed and candidate threatened and endangered species, state listed, and Bureau-sensitive species would be managed to support the conservation and protection of these species. Riparian and associated values on all streams, including headwater streams, would be protected. All existing ACECs would be retained and 34 new ones designated. Thirty-five rivers would be found suitable for designation as wild, 1 as scenic, and 12 as recreational. All identified scenic resources would be maintained, and VRM Class II management objectives would be applied to lands adjacent to recreation areas, highways, and rivers designated as state or federal wild and scenic rivers. Recreation management would emphasize dispersed nonmotorized opportunities. Special resource management practices would be applied in RIAs, which include lands zoned for 1-20 acre residential lots. Some management activities would not be allowed, and scenic quality would be managed to meet VRM Class II objectives.

The Proposed Resource Management Plan (PRMP)

The PRMP was developed partially in response to public comments related to the Bureau of Land Management's August 1992 draft resource management plans for western Oregon. In addition, the proposed plan incorporates the land use allocations and management direction from the 1994 Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and its Attachment A (hereafter referred to simply as ROD).

Vision

The Bureau of Land Management will manage the natural resources under its jurisdiction in western Oregon to help enhance and maintain the ecological health of the environment and the social well being of human populations.

There are several basic principles supporting this vision:

- natural resources can be managed to provide for human use and a healthy environment;
- resource management must be focused on ecological principles to reduce the need for single resource or single species management;
- stewardship, the involvement of people working with natural processes, is essential for successful implementation;
- the Bureau of Land Management cannot achieve this vision alone but can, by its management processes and through cooperation with others, be a significant contributor to its achievement; and
- a carefully designed program of monitoring, research and adaptation will be the change mechanism for achieving this vision.

Strategy

Lands administered by the Bureau of Land Management will be managed to maintain healthy, functioning ecosystems while providing a sustainable production of natural resources. This management strategy, titled ecosystem management, involves the use of ecological, economic, social, and managerial principles to ensure the sustained condition of the whole. Ecosystem management emphasizes the complete ecosystem instead of individual components and looks at sustainable systems and products that people want and need. It seeks a balance between maintenance and restoration of natural systems and sustainable yield of resources.

The building blocks for this strategy are comprised of several major land use allocations: Riparian Reserves; Late-Successional Reserves; Adaptive Management Areas; Matrix, which includes General Forest Management Areas and Connectivity/Diversity Blocks; and a variety of special purpose management areas such as recreation sites, wild and scenic rivers, and visual resource management areas. These land use allocations are located and configured in the landscape to support overall ecosystem function and to meet the vision for management of federal lands in western Oregon. The major land use allocations are shown in figure S-1.

Each land use allocation will be managed according to specific objectives and management actions/direction. During initial implementation of the plan, the stated objectives and management actions/direction will provide the rules and limits governing actions and the principles specifying the environmental conditions or levels to be achieved and maintained. As BLM gains experience in implementing the plan and applying the concepts of adaptive management, the stated objectives and management actions/direction will be refined for specific geographic areas.

There are two major management concepts underlying the plan: Ecological Principles for Management of Late-Successional Forests, and the Aquatic Conservation Strategy.

Ecological Principles For Management of Late-Successional Forests

One goal of the Proposed Resource Management Plan is to maintain late-successional and old-growth species habitat and ecosystems on federal lands. A second goal is to maintain biological diversity associated with native species and ecosystems in accordance with laws and regulations.

All land use allocations described in the Proposed Resource Management Plan will contribute to these two goals. For instance, Late-Successional Reserves, Riparian Reserves, and many special management areas (e.g., areas of critical environmental concern) will be managed to enhance and/or maintain late-successional forest conditions. The General Forest Management Area and Connectivity/Diversity Blocks will be managed to retain late-successional forest legacies (e.g., coarse woody debris, green trees, snags, and late-successional forest patches).

Aquatic Conservation Strategy

The Aquatic Conservation Strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy will protect salmon and steelhead habitat on federal lands managed by the Forest Service and Bureau of Land Management within the range of the Pacific Ocean anadromy.

The Aquatic Conservation Strategy is designed to meet the following objectives:

- Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.
- Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, up slope areas, headwater tributaries, and intact refuge. These lineages must provide chemically and physically unobstructed routes to areas critical for fulfilling life history requirements of aquatic and riparian-dependent species.
- Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.
- Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.
- Maintain and restore the sediment regime under which an aquatic ecosystem evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
- Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing (i.e., movement of woody debris through the aquatic system). The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
- Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
- Maintain and restore the species composition and structural diversity of plant communities in riparian zones and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
- Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

The components of the Aquatic Conservation Strategy are riparian reserves, key watersheds, watershed analysis, and watershed restoration.

Riparian Reserves

See Riparian Reserves in the following section.

Key Watersheds

A system of Key Watersheds that serve as refuge is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refuge include areas of high quality habitat and areas of degraded habitat. Key Watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program.

There are two types of Key Watersheds: Tier 1 and Tier 2. Tier 1 watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. Tier 2 watersheds do not contain at-risk fish stocks, but they are important sources of high quality water. There are no tier 2 key watersheds within the planning area. Key watersheds in the district are as follows:

Key Watershed	Acres
Beaver Creek	2,710
Cave/Grayback Creeks	40
Elk Creek	21,660
Indigo Creek	270
Jenny Creek	45,370
Little Applegate River	1,720
Middle Creek	190
Palmer Creek	430
South Fork/North Fork Little Butte Creek	26,900
South Fork Coquille River	140
South Umpqua River	190
Silver Creek	8,490
Taylor Creek	1,880
Upper Sucker Creek	1,330
West Fork Cow Creek	26,410
Yale Creek	1
Total	137,730

Key Watersheds overlay portions of all land use allocations in the district and place additional management requirements or emphasis on activities in those areas.

Watershed Analysis

Watershed analysis is one of the principal analytical tools that will be used to meet the ecosystem management objectives of this RMP. Watershed analyses will be the mechanism to support ecosystem management at approximately the 20 to 200-square mile watershed level.

Watershed analysis will focus on collecting and compiling information within a watershed that is essential for making sound management decisions. It will be an analytical process, not a decision-making process with a proposed action requiring NEPA documentation. It will serve as a basis for developing project-specific proposals, and determining monitoring and restoration needs for a watershed. Project-specific NEPA planning will use information developed from watershed analysis. For example, if watershed analysis shows that restoring certain resources within a watershed could contribute to achieving Aquatic Conservation strategy objectives, then subsequent decisions will need to address that information.

Watershed Restoration

Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. The most important components of a watershed restoration program are control and prevention of road-related runoff and sediment production, restoration of the condition of riparian vegetation, and restoration of in-stream habitat complexity. Other restoration opportunities include meadow and wetland restoration and mine reclamation.

Riparian Reserves

Riparian Reserves support Aquatic Conservation Strategy objectives and provide habitat for special status species and ROD special attention species.

There are approximately 369,200 acres of riparian reserves in the district. Calculation of these acres is based on prescribed widths and estimated miles of stream in the various categories described in the SEIS ROD. The widths are intended to provide a high level of fish, wildlife and plant habitat, and riparian protection until watershed and site analysis can be completed. Although Riparian Reserve boundaries on permanently flowing streams may be adjusted, they are considered to be the approximate widths necessary for attaining Aquatic Conservation Strategy objectives.

Riparian Reserves consist of the stream and the area on either side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance initially calculated as follows, whichever is greatest.

Fish-bearing streams: equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel).

Permanently flowing non-fish-bearing streams: equal to the height of one site-potential tree, or 150 feet slope distance.

Seasonally flowing or intermittent streams, wetlands less than one acre, and unstable and potentially unstable areas: equal to the height of one site-potential tree, or 100 feet slope distance.

In the last case and in the following ones, Riparian Reserves include the extent of unstable and potentially unstable areas, and the extent of the wetland or water body. In the following ones they also include the extent of seasonally saturated soil, and distances initially calculated as follows, whichever is greatest:

Constructed ponds and reservoirs, and wetlands greater than one acre: equal to the height of one site-potential tree, or to 150 feet slope distance from the edge of a wetland greater than one acre or the maximum pool elevation of constructed ponds and reservoirs.

Lakes and Natural Ponds: equal to the height of two site-potential trees, or 300 feet slope distance.

As a general rule, management actions/direction for Riparian Reserves prohibit or regulate activities that retard or prevent attainment of Aquatic Conservation Strategy objectives. Watershed analysis and appropriate National Environmental Policy Act compliance will be required to change Riparian Reserves in all watersheds.

Timber harvest including fuelwood cutting will be precluded in Riparian Reserves, with exception of salvage if required to attain Aquatic Conservation Strategy objectives after catastrophic events, or when watershed analysis determines that present and future woody debris needs are met and other Aquatic Conservation Strategy Objectives are not adversely effected.

Silvicultural practices will be applied in Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives.

New roads in Riparian Reserves will be designed to meet Aquatic Conservation Strategy objectives.

Late-Successional Reserves

Late-Successional Reserves will be established to protect and enhance conditions of late-successional and old growth forest ecosystems, which serve as habitat for late-successional and old growth forest-related species including the northern spotted owl and marbled murrelet; and to maintain a functional, interacting, late-successional and old-growth forest ecosystem.

There are 214,882 acres of Late-Successional Reserves in the district. The five components of this reserve system are:

Mapped Late-Successional Reserves: These reserves incorporate Key Watersheds to the extent practicable; some or parts of the most ecologically significant and ecologically significant late-successional forests identified by the Scientific Panel on Late-Successional Forest Ecosystems; and some or parts of the Designated Conservation Areas from the Final Draft Spotted Owl Recovery Plan.

Late-Successional/Old Growth 1 and 2 areas within Marbled Murrelet Zone 1, as mapped by the Scientific Panel on Late-Successional Forest Ecosystems.

Occupied marbled murrelet sites.

Known northern spotted owl activity centers (as of January 1, 1994).

Protection buffers for Special Status and ROD Special Attention Species.

See Maps 2-1 and 2-8 for locations of Late-Successional Reserves. Known northern spotted owl activity centers are unmapped. There are no known protection buffers species sites nor occupied marbled murrelet sites within the planning area.

Silvicultural treatments that are beneficial to the creation of late-successional habitat will be conducted inside Late-Successional Reserves.

If needed to create and maintain late-successional forest conditions, thinning operations will be conducted in forest stands up to 80 years of age. This will be accomplished by precommercial or commercial thinning of stands regardless of origin (e.g., planted after logging or naturally regenerated after fire or blowdown).

Salvage of dead trees in Late-Successional Reserves will be limited to areas where stand-replacing events exceed 10-acres in size and canopy closure has been reduced to less than 40 percent. All standing live trees, including those injured (e.g., scorched) but likely to survive, will be retained, as well as snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.

Adaptive Management Areas

Adaptive Management Areas were created as places to develop and test new management approaches to integrate and achieve ecological and economic health and other social objectives. They also are intended to contribute substantially to the achievement of ROD objectives, including provision of well-distributed late-successional habitat outside reserves; retention of key structural elements of late-successional forests on lands subjected to regeneration harvest; restoration and protection of riparian zones; and provision of a stable timber supply.

There are 150,752 acres of BLM-administered land in the Applegate Adaptive Management Area. A plan will be developed for the Applegate Adaptive Management Area. Management activities in the Applegate Adaptive Management Area will proceed while the plan is being developed.

Matrix (Connectivity/ Diversity Blocks and General Forest Management Area)

The lands in the Matrix are expected to:

- Produce a sustainable supply of timber and other forest commodities.
- Provide connectivity (along with other allocations such as Riparian Reserves) between Late-Successional Reserves.
- Provide habitat for a variety of organisms associated with both late-successional and younger forests.
- Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.
- Provide early-successional habitat.

In the Matrix, there are approximately 482,081 acres of BLM-administered land in the General Forest Management Area and 28,761 acres in Connectivity/ Diversity Blocks. Connectivity/Diversity Blocks vary in size and are distributed throughout the Matrix.

Timber harvest and other silvicultural activities will be conducted in that portion of the Matrix with suitable forestlands. Management direction is summarized in the Timber Resources section later in this summary.

Timber harvest will be conducted to provide a renewable supply of large down logs well distributed across the Matrix landscape in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand.

Green trees and snags will be retained throughout the Northern General Forest Management Area, including 6 to 8 green conifer trees per acre in regeneration harvest units. Snags will be retained within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. In addition, green trees will be retained for snag recruitment in timber harvest units where there is an identified, near-term (less than 3 decades) snag deficit. These trees do not count toward green-tree retention requirements. Connectivity/Diversity Blocks will be spaced throughout the Matrix in the northern GFMA. They will be managed to maintain 25 to 30 percent of each block in late-successional forest at any point in time. Riparian Reserves and other allocations with late-successional forest count toward this percentage.

Green trees and snags will be retained throughout the Southern General Forest Management Area, including 16 to 25 green conifer trees per acre in regeneration harvest units. Snags will be retained In fifth field watersheds (approximately 20 to 200 square miles) in which federal forest lands are currently comprised of 15 percent or less late-successional forest all remaining late-successional forest stands will be retained.

All remaining late-successional forest stands will be retained in fifth field watersheds (approximately 20 to 200-square miles) in which federal forestland is currently comprised of 15 percent or less of late-successional forest.

Air Quality

Efforts to meet National Ambient Air Quality Standards, Prevention of Significant Deterioration goals, and the visibility protection plan will continue. Activities will be conducted so as to maintain and enhance air quality and visibility in a manner consistent with the Clean Air Act and the Oregon State Implementation Plan.

Smoke emissions will be controlled to meet State targets for reduction from historical levels. This will be accomplished by planning, conducting, monitoring, and, if necessary, adjusting prescribed fire activities in accordance with the State Implementation Plan and the Oregon Smoke Management Plan.

The potential for wildfire emissions will be reduced through the use of prescribed fire and other fuels management techniques. Methods for slash disposal, site preparation, etc., which reduce the need to burn will be developed and used. The selected methods will be as consistent with ecosystem management objectives as possible.

At times, actions needed to meet ecosystem management objectives may conflict with State of Oregon Air Quality Standards.

Water and Soils

The Aquatic Conservation Strategy and Riparian Reserve management previously discussed are the main elements of water and soils management.

In addition, management will comply with water quality requirements to restore and maintain water quality to protect recognized beneficial uses and will strive to improve and/or maintain soil productivity.

Soil and water conditions will be improved and/or maintained by closing selected areas to off-highway vehicle use and/or limiting such use to existing or designated roads and trails. See the Recreation section later in this summary for additional details.

BLM will continue to implement a nonpoint source management program in cooperation with the U. S. Environmental Protection Agency and the Oregon Department of Environmental Quality. Coordination with the Oregon Department of Environmental Quality for implementation of best management practices which protect beneficial uses of water will also continue.

Consistency of management activities with Oregon's Statewide Water Quality Management Plan for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41) will be ensured.

Flood plains and wetlands will be protected in accordance with Executive Orders 11988 and 11990 and BLM's Riparian-Wetlands Initiative for the 1990s.

Fragile soils (granitics, schists, and pyroclastics) will be managed with protective measures to minimize surface disturbance. In addition, approximately 49,600 acres of watersheds with high risk of adverse cumulative effects will be deferred from timber harvest and other surface disturbing activities for one decade.

Special Status And SEIS Special Attention Species Habitat

Management will be designed to protect, manage, and conserve federal listed and proposed species and their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and Bureau special status species policies. Management for the conservation of federal candidate and Bureau-sensitive species and their habitats will focus on not contributing to the need to list and to recover the species. Management for the conservation of state listed species and their habitats will be designed to assist the state in achieving management objectives.

Assessment species (which are of lesser concern) will be managed where possible so as to not elevate their status to any higher level of concern. ROD special attention species will also be managed so as not to elevate their status to any higher level of concern.

Community structure, species composition, and ecological processes of special status plant and animal habitat will be maintained or restored.

BLM will consult with or request technical assistance from the U.S. Fish and Wildlife Service (USF&WS) or National Marine Fisheries Service (NMFS) for any proposed action that may effect federal listed or proposed species or their critical or essential habitat. Based on the results of consultation, the proposed action will be modified, relocated, or abandoned.

Table S-3 shows the numbers of special status plant and animal species that have been identified as inhabiting BLM-administered lands in the planning area:

The survey and manage provision of the ROD will be implemented within the ranges of its special attention species and the particular habitats that they are known to occupy.

Protection buffers will be provided for specific rare and locally endemic species and ROD special attention species in the upland forest Matrix.

Establishment of Late-Successional Reserves and other general allocations provide the framework for protection of the northern spotted owl. In addition, 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center in the Matrix will be retained for all known (as of January 1, 1994) spotted owl activity centers.

As noted previously, Late-Successional Reserves include Late-Successional/Old Growth 1 and 2 areas in marbled murrelet Zone 1 and all occupied murrelet sites. In addition, contiguous existing and recruitment habitat for marbled murrelets (i.e., stands that are capable of becoming marbled murrelet habitat within 25 years), within a 0.5 mile radius of any site where the birds' behavior indicates occupation, will be protected.

To support the Pacific Bald Eagle Recovery Plan, four existing nest sites will be protected. An additional ten areas will be protected to maintain their potential to provide future nest sites.

To support the Peregrine Falcon Recovery Plan, two existing nest sites will be protected. In addition, potential cliff nest areas will be protected to maintain their ability to provide future nest sites.

No marbled murrelets are known to exist within the planning area.

Wildlife Habitat

Late-Successional Reserve, Riparian Reserve, and Matrix management all contribute to management of wildlife habitat. Management will be directed to enhance and maintain biological diversity and ecosystem health to contribute to healthy wildlife populations. Management for Special Status and ROD Special Attention Species Habitat (discussed later) also addresses many wildlife species.

Special habitats such as cave entrances, meadows, and wetlands will be managed to protect their primary wildlife habitat values. They will also be buffered from 100-200 feet from timber harvest and other surface-disturbing activities, depending upon site-specific characteristics.

The habitat of elk and other species will be protected through off-highway vehicle (OHV) designations and the closure of certain roads to the public to minimize disturbance. To help meet population goals of the Oregon Department of Fish and Wildlife, forage plants would be seeded where appropriate. This will be done following timber harvest in big game management areas where big game forage is considered deficient and where seeding will be compatible with other resource objectives. Such seeding is expected to maintain habitat conditions on BLM-administered lands.

Fish Habitat

The Aquatic Conservation Strategy drives fish habitat management. Riparian Reserve management is a key element of management intended to maintain or enhance the fisheries potential of streams and other waters consistent with BLM's Fish and Wildlife 2000 Plan, the Bring Back the Natives initiative, and other nationwide initiatives. This management is also intended to promote the rehabilitation and protection of fish stocks at risk and their habitat.

Priority for fish habitat enhancement projects will be given to watersheds supporting at-risk fish species and stocks and those requiring extensive restoration. Actions will be taken to rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish. Possible rehabilitation measures could include, but not be limited to, fish passage improvements, instream structures using boulders and log placement to create spawning and rearing habitat, placement of fine and coarse materials for over-wintering habitat, riparian rehabilitation to establish or release existing coniferous trees, improvement of roads that contribute to sedimentation, and rehabilitation of other upland areas that contribute to deteriorated instream conditions.

Special Areas

All three existing areas of critical environmental concern (ACECs), two research natural areas (RNAs), and three environmental education areas

(EEAs) will be retained. An additional 14 new ACECs, 11 new RNAs, and 1 new EEA will be designated. In addition, two special emphasis areas will be designated. Approximately 10,600 acres in the Illinois Valley will be managed as a botanical emphasis area, and 16,300 acres in the Cascade/Siskiyou ecological emphasis area located near Soda Mountain and Agate Flat will be managed as for its complex ecological values.

Recreation

Management will aim to provide a wide range of developed and dispersed recreation opportunities that contribute to meeting projected recreation demand within the planning area in a manner consistent with BLM's Recreation 2000 Implementation Plan and Oregon-Washington Public Lands Recreation initiative. Scenic, natural and cultural resources will be managed to enhance visitor recreation experience expectations and produce satisfied public land users. Locally-sponsored tourism initiatives and community economic strategies will be supported by providing recreation projects and programs that benefit both short and long term implementation.

All 11 existing recreation sites and 14 trails will remain open. Twenty-nine additional recreation sites and 15 additional trails will be developed when funding becomes available. The emphasis of facility management and development will be to accommodate the increasing demand for recreation opportunities on or adjacent to water. In addition to the three existing special recreation management areas, two additional areas will be designated.

In addition to the three previously designated back country byways, eight new road segments (both BLM roads and county roads on BLM-administered lands) for a total of 333 miles will be designated back country byways components of the National Scenic Back Country Byway System.

As part of off-highway vehicle (OHV) use management, 25,200 acres will be closed year-round to vehicle use, however, these areas will not be closed to administrative use. The remainder of the planning area (about 833,100 acres) will be designated as either limited or open to OHV use. Off-highway vehicle use will be specifically provided for in three areas.

Demand for all recreation activities is expected to increase during the life of the PRMP. Expected demand will be met for all activities except OHV use. Additional emphasis will be placed on interpretive and informational signs and maps to support state and local strategies for encouraging tourism and to facilitate public use of BLM resource lands.

Wild and Scenic Rivers

Four river segments covering about 19 miles are found suitable for designation as wild by Congress under the Wild and Scenic Rivers Act (see Table S-4). If designated by Congress, these will be additions to the National Wild and Scenic Rivers System. Forty-three other river segments covering approximately 168 miles found eligible for potential designation and studied by BLM are found not suitable for such designation.

Visual Resources

The 14,330 acres protected by Congressional designation will be managed for preservation of scenic quality. Another 113,730 acres of other highly sensitive land adjacent to important recreation sites and along some major travel routes will be managed to retain scenic quality so landscape alterations caused by management will not attract attention. An additional 393,100 acres of visually-sensitive land will be managed to partially retain scenic quality and so landscape alterations would not dominate the view.

Cultural Resources Including American Indian Values

Cultural resource localities will continue to be identified and managed for public, scientific, and cultural heritage purposes.

Responsibilities to appropriate American Indian groups regarding heritage and religious concerns will be fulfilled.

Timber Resources

Management will provide a sustainable supply of timber and other forest products and will seek to achieve a balance between wood volume production, quality of wood, and timber value at harvest.

Lands available for scheduled timber harvest are as follows:

Land Use Allocation	Approx. Gross Acres	Approx. Net Acres
Matrix General Forest Management Areas (including visual resource management class II, rural interface, and TPCC restricted) (excludes RHAs and deferred watershed)	448,778	147,093
Connectivity/Diversity Blocks (excludes RHAs)	27,237	11,121
Applegate Adaptive Management Area (AMA) (excludes AMR)	113,914	32,781

The allocation of lands available for scheduled timber harvest is shown in Figure S-2.

The annual probable sale quantity (PSQ) from these allocations and the management planned for the Matrix (with extrapolation of management assumptions for the southern General Forest Management Area (GFMA) to the Applegate Adaptive Management Area (AMA)) is 9.7 million cubic feet (57.1 million board feet). Not included in the PSQ estimates is "other wood" or "nonchargeable volume." This is timber harvest conducted to meet other resource objectives or occurs on lands where there are no scheduled timber harvest.

The probable sale quantity (PSQ) for the PRMP is an estimate of annual average timber sale volume likely to be offered from lands allocated to planned, sustainable harvest. It is an approximation because of the difficulty associated with predicting actual timber sale levels over the next decade, given the complex nature of many of the standards and guidelines and overlapping land use allocations. It represents BLMs best assessment of the average annual amount of timber likely to be offered over the life of the plan, following a start-up period. The use of PSQ, rather than "Allowable Sale Quantity" (ASQ) recognizes that the estimate may change due to uncertainties in the assumptions. Harvest of this approximate volume of timber is considered sustainable over the long term based on the assumptions that the available land base remains fixed, and that funding is sufficient to make planned investments in timely reforestation, plantation maintenance, thinning, genetic selection, forest fertilization, timber sale planning, related forest resource protection, and monitoring.

The actual sustainable timber sale level attributable to the land-use allocations and management direction of the PRMP may deviate by as much as 20 percent from the identified PSQ. The potential variables are discussed in the Timber Resources section of chapter four. The separable component of the PSQ attributable to lands in key watersheds also carries a higher level of uncertainty, due to the greater constraints of Aquatic Conservation Strategy objectives and the requirement to do watershed analysis before activities can take place.

Logging systems will be selected based on the suitability and economic efficiency of each system for the successful implementation of the silvicultural prescription, for protection of soil and water quality, for the successful retention of desired structure, and to meet other land use objectives.

Regeneration harvests will be scheduled to assure that, over time, harvest would occur in stands at or above the age of volume growth culmination (i.e., culmination of mean annual increment). This refers to the age range which produces maximum average annual growth over the lifetime of a timber stand. In the planning area, culmination for most regimes and sites occurs near 100 years of age. During the first decade, regeneration harvests would generally be scheduled in stands less than 100 years of age in the northern GFMA and 120 years of age in the southern GFMA.

Silvicultural treatments and harvest designs will be based on the functional characteristics of the ecosystem and on the characteristics of forest stands and sites. Treatments will be designed, as much as possible, to prevent the development of undesirable species composition, species dominance, or other stand characteristics. The principles of integrated pest management and integrated vegetation management will be employed to reduce the need for direct treatments. Herbicides will be used only as a last resort.

Harvest of marketable hardwood stands will be planned in the same manner as conifer stands, if the land is not otherwise constrained from timber management. Volume from projected hardwood harvest is included in the other wood estimate. Where hardwood trees became established following previous harvest of conifers, reestablishing a conifer stand on the site will be planned.

Unscheduled harvests may occur from thinning and salvage in Late-Successional Reserves and Riparian Reserves. Forest health operations that produce volume or biomass as a by-product may occur in any allocation, consistent with management objectives for that allocation.

Special Forest Products

The BLM will manage special forest products (SFPs) for production and sale when demand is present and where actions taken are consistent with primary objectives for the land use allocation. The principles of ecosystem management will be used to guide the management and harvest of special forest products.

Energy and Minerals

Most BLM-administered land will remain available for mineral leasing (of oil and gas or geothermal resources) and location of mining claims. But a variety of designations and allocations (such as areas of critical environmental concern, late-successional reserves, riparian reserves) will restrict exploration and development activities.

Socioeconomic Conditions

Management will contribute to local, state, national and international economies through sustainable use of BLM-managed lands and resources and use of innovative contracting and other implementation strategies. Management will also continue to provide amenity values (e.g., recreation facilities, protected special areas, and high quality fisheries) that enhance communities as places to live and work.

BLM management programs for all actions are expected to support 1,096 jobs and provide $17.6 million a year in personal income during the life of the plan. Those jobs are 1,103 (50 percent) less than the average supported in the 1984-1988 baseline period.

The net decline in jobs cited above combines with an expected decline in jobs supported by U.S. Forest Service and private and other timber suppliers. This would lead to substantial job losses in some communities in the planning area with consequent adverse effects on community stability. Communities with more diverse economies would be effected less, while those communities which are closely tied to the timber industry could be severely effected.

Jobs are also supported by downstream and off-shore recreational and commercial fishing for fish supported by BLM habitat. However, fishing opportunities related to BLM management are not expected to change in the next ten years.

Land Tenure Adjustments

Land tenure adjustments will emphasize exchanges to benefit multiple resource values. As a matter of practice, O&C forestlands allocated to timber management will only be exchanged for lands to be managed for multiple-use purposes. Any exchange involving O&C lands will be done in close consultation with the O&C counties. Lands are categorized in the following zones: Zone 1 land (approximately 292,100 acres), will be retained in BLM's administration; Zone 2 land (approximately 558,600 acres), emphasis will be placed on retaining land under BLM administration, however, land may be blocked up in exchanges for other lands, transferred to other public agencies, or given some form of cooperative management; and Zone 3 land (approximately 7,600 acres), which are scattered and difficult to manage, will be available for sale or exchange.

Rural Interface Areas

Resource management activities will be altered, where feasible, on 137,500 acres of BLM-administered land within one-quarter mile of private land in identified RIAs (zoned for 1-20 acre lots) to mitigate adjacent neighbors' concerns. These lands will also be managed under VRM Class III objectives. Examples of management options that could be used include different harvest regimes, hand application rather than aerial application of herbicides and pesticides, hand piling slash for burning as opposed to broadcast burning, and control of understory near residents.

Roads

Road management will correct problems associated with high road density by emphasizing the reduction of minor collector and local road densities where those problems exist. Roads will be managed to meet the needs identified under other resource programs.

Fire

Prescribed fire, including underburning will be used as a favored tool for site preparation, fuel hazard reduction, and to restore the natural role of fire in the ecosystem. It will also be used to facilitate meeting a number of resource objectives including management for forest health, wildlife habitat, and special status species habitat. All burning will be done in accordance with the objectives of the Oregon Smoke Management Plan.

Monitoring the Resource Management Plan

Monitoring and evaluation of the Resource Management Plan will be carried out at appropriate intervals for the following purposes.

- To ensure activities are occurring in conformance with the RMP.
- To determine if activities are producing the expected results.
- To determine if activities are causing the effects identified in the EIS.

Consistency with State, Local, Tribal, and Other Federal Plans

BLM planning regulations require that resource management plans be consistent with officially approved or adopted resource-related plans, and the policies and procedures therein, of the Federal agencies, state and local governments and Indian tribes, so long as the RMPs are also consistent with applicable Federal laws and regulations. The BLM has compared the PRMP with a variety of such plans of other agencies. The PRMP appears to be consistent with all such plans, policies and procedures, except perhaps the following:

- Possible cumulative effects of BLM and other landowners' activities in some watershed could lead to violation of the State of Oregon's antidegradation policy.

- Possible inconsistency with Oregon's Statutory Wildlife Policy, by maintaining some wildlife populations at less than optimum.

- Possible inconsistency with the clear cut size and proximity requirement of Section 4 of the Oregon Forest Practices Act.

- Possible delay in reforestation beyond the one year required by the Oregon Forest Practices Act, due to the requirement for smoke management clearance before burning slash.

- Probable inconsistency with the Oregon Benchmarks for increasing standard of living, affordable housing, family stability, and stable home life.

- Inconsistency with Oregon statewide planning Goal 8 (Recreational Needs) due to failure to meet demand for off-highway vehicle use.

- Partial inconsistency with Oregon statewide planning Goal 9 (Economy of the State), due to reduced levels of BLM-resource-dependent employment and payments to counties.

- Possible inconsistency with complying the Oregon's State Implementation Plan conformity rules at the project level when conducting underburning, primarily to meet ecosystem management objectives.

Public Involvement

Public involvement has been an integral part of BLM's Resource Management Planning effort. Activities have included mailers or brochures, public meetings, open houses, field trips, distribution of planning documents and related comment periods, informal contacts, group meetings, and written letters and responses to comments. These efforts began in May 1986.

Subsequent mailers at least once a year requested comments on issue identification, development of planning criteria contained in State Director Guidance for the process, and BLM's Analysis of the Management Situation which set the baseline for development of the RMP/EIS. Suggestions for formulation of the PRMP were also requested.

The Draft RMP/EIS was released for public review and comment in 1992. Comments were evaluated and some substantive recommendations led to changes in the Proposed RMP or the analysis of environmental consequences. Any protests to the director of BLM will be reviewed and addressed before a record of decision (ROD) on the RMP is completed. Comments directly to the District Manager will also be considered in formulating the decision.

Table S-1. Comparisons of Allocations and Management by Alternative[1]

Allocations/Management Actions by Alternative	PRMP	PA
Water Quality and Riparian Zones		
Protection of Riparian Management Areas (Average width in feet each side of stream)[4]		
Stream Order: 1	[6]	
2	[6]	
3	[6]	105
4	[6]	150
5	[6]	210
6+	[6]	240
Lakes, ponds, and other waters	[6]	150
Acres in RMAs/Riparian Reserves	[6]	71,700
Protection of Sensitive Soil Areas:		
Acres excluded from harvest or other ground disturbing activities (i.e., FGR acres in Alternative E)	–	–
Areas where timber harvest or other ground-disturbing activities would be allowed but restricted (acres)	78,800	85,300
Areas deferred for one decade from timber harvest and other ground-disturbing activities (acres)	49,600	28,000
Old Growth and Mature Forest Habitat		
Management Direction	Manage 25% of the land as Late-Successional reserves. Manage 3% of land as connectivity/ diversity block for old growth associated species.	Manage 24% of the land as an old growth emphasis area. Manage 2% of land as connectivity area for old growth associated species.
Acres managed for retention and development of older forest.	497,500	285,300
Acres manages for maintenance of older forest characteristics.	–	214,300
Existing Older Forest Retained.	128,700	128,700

No Action	A	B	C	D	E
					50
				60	60
–	75	75	105	140	200
–	75	100	150	200	200
–	75	140	210	280	280
–	75	160	240	320	320
	75	100	150	200	400
13,000	35,600	43,400	60,600	114,500	158,900
–	–	–	–	–	101,000
				85,300	37,200
		Contribute to habitat diversity and old growth in a corridor system with blocks of 640 acres connected by 80-acre stepping-stone blocks.	Manage for retention and improvement of biological diversity maintaining 17% of the land in restoration and retention blocks.	Manage as recommended by the 1990 Conversation Strategy for the northern spotted owl.	Contribute to habitat diversity by protecting existing stands over 150 years old, suitable spotted owl habitat within two miles of each spotted owl site and additional habitat to benefit amphibians and pileated woodpeckers.
191,700	45,500	106,300	265,900	321,300	593,500
0	0	0	401,100	0	–
128,700	7,409	25,100	135,400	151,500	304,500

Table S-1. Comparisons of Allocations and Management by Alternative[1] (continued)

Allocations/Management Actions by Alternative	PRMP	PA
Timber		
Forest Management Allocations (acres):		
Intensive	78,000	125,300
Restricted	113,000	256,400
Woodlands		–
Enhancement of Other Uses or Not Available	(467,000)	(285,300)
Total	668,100	485,800
Practices (assumed average annual acres for 1st decade):		
Regeneration		
Harvest	1,040	4,300
Woodlands Harvest		–
Overstory Removal	100	300
Commercial Thinning/Density Management	1,860	2,000
Conversion	–	–
Site Preparation		
Prescribed Fire	600	2,500
Other	100	460
Planting, regular stock	270	1,100
Planting, genetic stock	1,030	4,300
Stand Maintenance/Stand Protection	2,500	10,400
Stand Release/Precommercial Thinning	7,800	7,800
Fertilization	5,700	5,700
Miles of New Road Construction	20/120	44/220
Underburning (acres) – Timber and other resource related	800	1,800
Pruning	1,860	1,860
Harvest (MMCF/MMBF)	10/57	18/105
Harvest (MMCF.MMBF) (Woodlands)		–
Special Status Species including threatened and Endangered Species Habitat		
Management Direction	Manage habitats of Federal Candidate, State Listed, SEIS special attention species, and Bureau Sensitive species on all BLM administered lands.	Manage habitats of Federal Candidate, State Listed, SEIS special attention species, and Bureau Sensitive species on all BLM administered lands.
Acres managed for all Category 1 and 2 Federal Candidate, State Listed and Bureau Sensitive species plants and animals	859,100	867,500
Wildlife (Including Fisheries)Habitat		
Buffer width, special habitats (feet)	100-200	100-200
Fish habitat improvement (miles)	40	40
Acres managed for big game management	205,100	205,100
Acres managed for big game and timber harvest excluded	–	–

No Action	A	B	C	D	E
439,200	534,800	488,700	0	0	7,500
5,200	0	7,700	401,100	345,700	66,000
	86,700	64,300			
(191,700)	(45,500)	106,300)	(265,900)	(321,300)	(593,500)
423,100	246,000	306,800	466,400	521,800	794,000
4,800	6,100	5,700	3,500	3,000	1,300
	580	430			
2,200	2,000	1,900	230	730	280
950	1,200	1,200	740	680	250
–	800	800	–	530	10
2,800	3,600	3,420	2,100	1,800	750
520	640	600	290	330	130
1,400	4,000	3,600	2,200	880	320
4,600	4,600	4,600	2,200	3,500	1,300
11,700	16,700	15,900	8,600	8,500	3,100
7,800	7,800	7,800	7,800	5,000	1,100
5,700	5,700	5,700	5,700	3,700	790
59/320	69/374	69/374	62/340	70/380	23/120
		500	1,500	1,400	1,100
	1,900	1,700	1,400	1,200	256
36/194	49/292	44/266	11/62	13/77	5/31
–	2/9	1.4/6.5	–	–	–
Manage habitats of Federal Candidate, State Listed and Bureau Sensitive species on all BLM administered lands.	Protect habitats of Federal Candidate, State Listed and Bureau Sensitive species where such mitigation would not diminish commercial use.	Same as a plus protect those habitats on public domain lands.	Same as B plus additional protection provided by management for older forests.	Protect habitats Federal Candidate, State Listed and Bureau Sensitive species on all BLM administered lands.	Same as D.
867,500	246,100	356,200	498,600	867,500	867,500
			100-200	100-300	100-300
	40	40	40	40	40
			118,100	118,100	235,200
					15,000

Table S-1. Comparisons of Allocations and Management by Alternative[1] (continued)

Allocations/Management Actions by Alternative	PRMP	PA
Special Areas		
Existing RNA/ACECs retained (#/acres)	2/670	2/670
Other Existing ACECs retained (#/acres)	3/2,600	3/2,600
New RNA/ACECs designated (#/acres)	11/8,400	10/8,400
Other new ACECs designated (#/acres)	14/5,200	12/5,200
Total RNA/ACECs (#/acres)	13/9,100	12/9,100
Total other/ACECs (#/acres)	16/7,000	14/7,800
Environmental Education Areas (#/acres)	4/550	4/380
Recreation Resources		
Recreation sites		
Existing (# sites/acres)	11/950	11/950
New (# sites/acres)	29/850	22/900
Trails maintained		
Existing (# trails/acres)	14/80	14/80
New (# trails/acres)	16/160	16/160
Special Recreation Management Areas		
Existing (#/acres)	3/43,000	3/43,000
New (#/acres)	2/13,000	2/13,000
Back Country Byways (#/miles)	11/335	11/330
Acres open to OHV use	391,400	–
Acres limited to OHV use	441,700	820,100
Acres closed to OHV use	25,200	–
Wild and Scenic Rivers		
River segments found suitable for designation:		
As Recreational (#/miles)	4/20	–
As Scenic (#/miles)		–
As Wild (#/miles)		5/20

No Action	A	B	C	D	E
2/670		2/670	2/670	2/670	2/670
3/2,600	1/1,200	3/2,600	3/2,600	3/2,600	3/2,600
		1/600	7/6,000	7/6,000	10/8,400
			11/101,900	14/102,800	24/127,800
2/670		3/1,300	9/6,700	9/6,700	12/9,100
3/2,600	1/1,200	3/2,600	14/104,500	17/105,400	27/130,400
3/30		3/30	3/30	3/30	3/30
11/950	11/950	11/950	11/950	11/950	11/950
	1/20	5/200	33/1,330	60/2,490	60/2,490
14/80	14/80	14/80	14/80	14/80	14/80
	1/5	2/13	2/13	16/160	16/160
3/43,400	1/14,300	1/14,300	3/43,000	3/43,000	3/43,000
			3/19,000	3/19,000	4/24,000
3/130	3/130	3/130	8/260	8/260	10/330
801,900	783,900	725,600	403,200		
53,400	66,200	123,200	428,100	830,700	809,000
12,200	17,400	18,700	36,200	36,800	58,500
0	0				12/70
0	0	0	0		1/20
0	0	0	0	1/2	35/100

Table S-1. Comparisons of Allocations and Management by Alternative[1] (continued)

Allocations/Management Actions by Alternative	PRMP	PA
Visual Resources		
	Manage important scenic values such as SRMAs, I-5, Hwy 62, Rogue Wild Scenic river, Butte Falls – Prospect Hwy. Manage Northern GFMA as VRM IV and Southern GFMA and RIAs as VRM III.	Manage important scenic values such as SRMAs, I-5, Hwy 62, Rogue Wild Scenic river. Manage Northern GFMA as VRM IV and Southern GFMA as VRM III.
Acres managed VRM Class I	14,330	23,300
Acres managed VRM Class II	113,730	101,100
Acres managed VRM Class III	393,100	393,100
Acres managed VRM Class IV	337,370	350,000

No Action	A	B	C	D	E
	Manage available forestlands as VRM Class IV and all other lands as inventoried.	Manage available forestlands as inventoried within 1/4 mile of recreation site, State and Federal highways and designated rivers. Manage other available forestland as VRM Class IV. Manage all other lands as inventoried.	Same as B except on available forestland where BLM administered land is more than half of a viewshed, management as inventoried.	Manage all lands as inventoried, except RIA lands would be managed as VRM Class II	Same as D except manage as VRM Class III all lands inventoried as Class IV, and manage as Class I all lands within 1/4 mile of recreation sites, State and Federal highways and designated rivers.
47,300	23,300	23,300	23,300	23,300	74,300
81,700	30,900	84,200	201,000	376,000	682,200
131,500	31,800	108,200	272,600	249,200	111,000
607,000	781,500	651,800	370,600	219,000	

Table S-1. Comparisons of Allocations and Management by Alternative[1] (continued)

Allocations/Management Actions by Alternative	PRMP	PA
Land Tenure		
	Make exchanges to benefit one or more of resources managed. Sell land other than O & C commercial forestland that meet FLPMA 203 (a).	Make exchanges to benefit one or more resources. Sell lands other than O & C commercial forestland that meet FLPMA 203 (a).
Acres identified for retention (Zone 1).	292,100	301,000
Acres potentially eligible for exchange only (Zone 2).	558,600	558,800
Acres potentially eligible for sale or exchange (Zone 3).	7,600	7,400
Rights-of-way Avoidance Areas (acres)[5]	179,800	179,800
Rights-of-way Exclusion Areas (acres)	43,300	43,300
Energy and Mineral Management		
Acres available for oil and gas and geothermal leasing.	772,200	772,200
Acres closed to oil, gas and geothermal lease.	22,000	22,000
Acres open to oil and gas and geothermal mineral leasing with no surface occupancy (NSO)	73,300	73,300
Acres open to mining claim location and operation.	829,900	829,900
Acres closed to mining location.	37,600	37,600

No Action	A	B	C	D	E
Land tenure zones not identified.	Make exchanges to enhance nondeclining timber harvest level on BLM administered land. Sell or lease no commercial timberland.	Make exchanges of O&C and CBWR lands emphasizing opportunities primarily to enhance timber management opportunities. Sell public domain lands and O&C lands other than available commercial forestlands, meeting criteria of FLPMA Sec. 203(a). Make leases to accommodate other appropriate uses.	Same as B except also make exchanges to contribute to conservation of biological diversity.	Emphasize exchanges to acquire lands with nontimber values. Sell lands other than available commercial forestlands, meeting criteria (1) or (2) of FLPMA Sec. 203(a). Lease only under the Recreation and Public Purpose Act,.	Same as D.
N/A	301,000	301,000	301,000	301,000	301,000
3,400	558,800	558,800	558,800	558,800	558,800
3,700	7,400	7,400	7,400	7,400	7,400
97,000	67,400	127,700	326,300	491,600	819,300
27,000	26,400	27,600	33,000	33,700	71,100
831,500	805,500	793,500	714,700	718,800	680,800
22,000	22,000	22,000	22,000	22,000	22,000
14,000	37,000	52,000	130,800	126,700	164,700
846,000	845,900	844,200	837,400	835,300	802,900
21,500	21,600	23,300	30,100	32,200	64,600

Table S-1. Comparisons of Allocations and Management by Alternative[1] (continued)

Allocations/Management Actions by Alternative	PRMP	PA
Rural Interface Area Management		
Acres considered for alternative management practices	137,500	137,500
Acres where clearcutting, herbicide spraying and prescribed burning excluded		–
Acres managed for VRM Class II objectives		–
Acres managed for VRM Class III objectives	137,500	137,500

[1] See Narrative for Management Direction Common to All Narratives.

[2] Order 1 and 2 perennial streams would have an RMA equal to order 3 streams, Alternatives A-E

[3] Order 1, 2, and 3 fish-bearing streams would have a 150-foot RMA.

[4] Intermittant

[5] Does not include threatened and endangered species habitat, which would also be R/W avoidance areas.

[6] See SEIS ROD page C-30/31 for widths of riparian reserves in the PRMP.

[7] PA (Preferred Alternative) is provided for comparative purposes.

No Action	A	B	C	D	E
0	0	32,400	137,500	–	–
0	0	0	0	137,500	235,000
0	0	0	0	137,500	235,000
0	0	32,400	137,500	–	–

Table S-2 - Summary of Environmental Consequences, Comparison of Alternatives

			Alternatives				
Effects	**PRMP**	**No Action**	**A**	**B**	**C**	**D**	**E**
Air Quality							
(1,000 lbs of PM10 emissions[1] by decade from prescribed fires (Baseline 20.4 lbs (1,000))	5.0	10.8	9.6	9.7	6.5	7.0	3.4
Biological Diversity							
After 10 years (1,000 acres)							
Mature forest	195	112	157	162	172	176	199
Old-growth forest	107	87	77	86	115	107	124
After 100 years (1,000 acres)							
Mature forest	161	90	13	26	219	166	169
Old-growth forest	275	99	62	88	288	176	339
Riparian Trend (200 years: +,-,0)	+	-	-	-	+	+	+
Dominant Woodpecker Population (% of optimal, 10 years)	52	48	45	46	53	61	57
Elk Habitat (10 years)[4]							
No. of habitat areas improving	6	0	0	0	0	0	3
No. of habitat areas unchanged	7	2	2	2	5	0	2
No. of habitat areas declining	2	13	13	13	10	15	10
Fish Production Potential (long term 200 years)	mod+	low	low	low	mod+	mod+	high
Threatened and Endangered Species							
Suitable spotted owl habitat after 100 years (1,000 acres)	538	-	52	53	560	463	590
Existing and potential bald eagle nest sites protected	4	4	4	4	4	4	4
Visual Resources (10 years: +,–,0)	+	0	–	–	+	+	+
Wild and Scenic Rivers(47 river segments studied)[6]							
Number of outstandingly remarkable values beneficially affected (10 years)	6	0	0	0	34	35	37
Number of outstandingly remarkable values unaffected (10 years)	19	21	19	19	19	19	19
Number of outstandingly remarkable values adversely affected (10 years)	31	37	37	37	3	2	0

Table S-2 - Summary of Environmental Consequences, Comparison of Alternatives (continued)

				Alternatives			
Effects	**PRMP**	**No Action**	**A**	**B**	**C**	**D**	**E**
Recreation Use (capability to meet 10-year demand)[5]							
Off-highway travel	no	yes	yes	yes	yes	no	no
Nonmotorized travel	no	no	no	no	yes	yes	yes
Camping	no	no	no	no	yes	yes	yes
Picnicking, studying nature, etc.	no	no	no	no	yes	yes	yes
Boating	yes	yes	yes	yes	yes	yes	yes
Swimming, general waterplay	yes	yes	no	no	yes	yes	yes
Timber							
Percent change in timber supply (10 years) compared to baseline (1984-1988)	-44.6	-24.2	-11.6	-16.1	-44.6	-42.9	-49.1
Percent SCFL Available	34	80	96	87	72	62	13
Percent change in PSQ (cubic)	-73	0	+52	+28	-69	-64	-86
Socioeconomic Conditions (10 years) (Baseline 1984-1988)							
Total planning area jobs dependent on BLM activities (1,000s) (Baseline 2.2)	1.10	2.47	3.25	3.03	1.32	1.38	0.84
Total planning area jobs dependent on BLM activities (1,000s) (Baseline 45.5)	17.7	47.0	62.9	58.1	20.4	22.4	12.4
Average annual O&C receipts distributed to all western Oregon counties ($ million) (Baseline 63.4)	25.8	130.0	169.4	154.2	48.1	54.1	39.7

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[1] Tons of slash burned correlates directly with the level of emissions.

[2] Cumulative effects, all ownerships.

[3] The planning area was divided into 27 analytical watersheds. Twenty-three of the 27 were analyzed using representative watersheds where BLM administers substantial acreage.

[4] The planning area includes 15 elk habitat areas.

[5] For uses not listed, projected 10-year demand would be met under all alternatives.

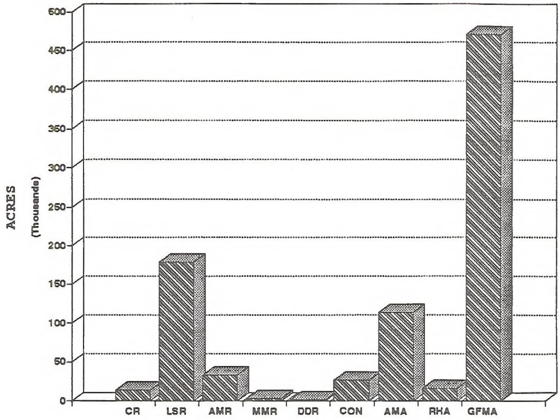
[6] Some river segments contain more than one outstandingly remarkable value.

Table S-3. Special Status Species Found on BLM-Administered Land

	Number of Plant Species	Number of Animal Species
Federal threatened	0	3
Federal endangered	0	1
Federal proposed	0	0
Federal candidate	30	23
State listed	2	3
Bureau-sensitive	2	1
State candidate	14	0
Bureau-assessment	15	21

Table S-4. Suitable Wild and Scenic Rivers

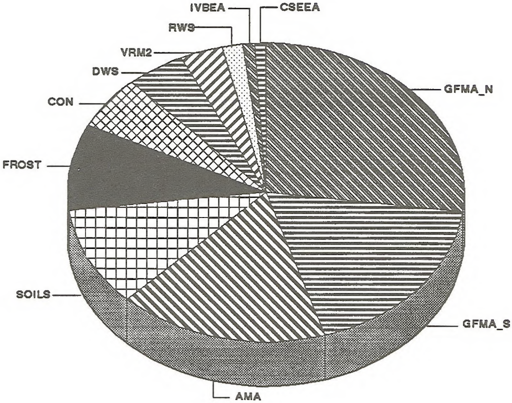
River Name	Segment Length	Proposed Classification
Big Windy Creek	6.8	Wild
East Fork Big Windy Creek	3.6	Wild
Dulog Creek	1.7	Wild
Howard Creek	7.0	Wild



			GROSS ACRES	PERCENT GROSS ACRES
RESERVES:	CONGRESSIONAL RESERVE (CR)	=	14,267	1.7%
	LATE SUCCESSIONAL RESERVE (LSR)	=	178,467	20.8%
	LSR IN ADAPTIVE MANAGEMENT AREA (AMR)	=	32,937	3.8%
	MARBLED MURRLET RESERVE (MMR)	=	3,478	0.4%
	DISTRICT DEFINED RESERVE (DDR)	=	1,290	0.2%
MATRIX:	CONNECTIVITY (CON)	=	27,237	3.2%
	ADAPTIVE MANAGEMENT AREA (AMA)	=	113,912	13.3%
	RESERVED HABITAT AREA (RHA)	=	16,732	1.9%
	GENERAL FOREST MANAGEMENT AREA (GFMA)	=	470,776	54.8%
			859,096	

Note: Riparian Reserves are not shown but occur across all land use allocations

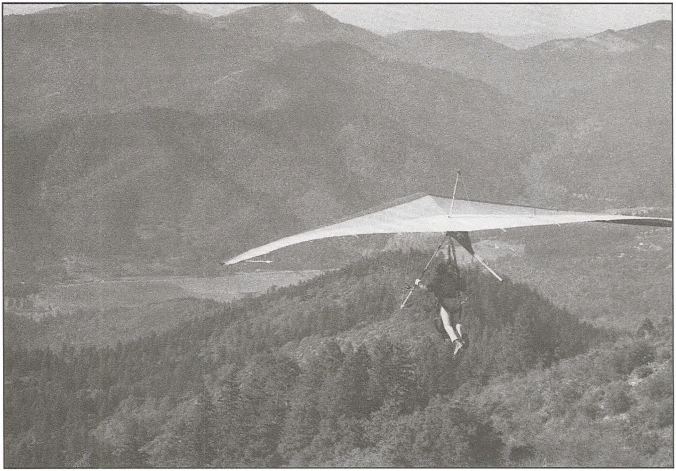
Figure S-1. *General Land Use Allocations for the Proposed RMP*



		TOTAL NET.OP ACRES	PERCENT NET.OP ACRES
GENERAL FOREST MANAGEMENT AREA_NORTH (GFMA_N)	=	51,920	27.2%
GENERAL FOREST MANAGEMENT AREA_SOUTH (GFMA_S)	=	34,468	18.0%
ADAPTIVE MANAGEMENT AREA (AMA)	=	32,781	17.2%
SENSITIVE SOILS (SOILS)	=	20,354	10.7%
FROST PRONE ZONE (FROST)	=	17,972	9.4%
CONNECTIVITY (CON)	=	11,121	5.8%
DEFERRED WATERSHED (DWS)	=	9,179	4.8%
VISUAL RESOURCE MANAGEMENT_CLASS 2 (VRM2)	=	6,578	3.4%
RESTRICTED WATERSHED (RWS)	=	3,236	1.7%
ILLINOIS VALLEY BOTANICAL EMPHASIS AREA (IVBEA)	=	1,824	1.0%
CASCADE SISKIYOU ECOLOGICAL EMPHASIS AREA (CSEEA)	=	1,562	0.8%
		190,995	

Figure S-2. *Acres Available for Timber Production by Category*

Chapter 1
Introduction



Summary of Major Changes

The Wild Rogue Wilderness Area is now managed by the U.S. Forest Service. The number of acres BLM administers reflects this change.

The "Purpose and Need" section has been expanded to explain that "Option 9" has been incorporated into the PRMP/FEIS.

Introduction

The Medford District's Proposed Resource Management Plan and Final Environmental Impact Statement (PRMP/FEIS) will guide the Bureau's (BLM) management of approximately 859,109 acres of public lands (public domain land and O&C land) for the next ten years or more, or until replaced by a revised plan. This PRMP has been prepared in accordance with the BLM's planning regulations found in 43 CFR 1600. The FEIS has been prepared in accordance with the Council of Environmental Quality's (CEQ) regulations for implementing the National Environmental Policy Act (NEPA) of 1969, found in 40 CFR 1500. A list of the major Federal laws and executive orders affecting BLM land management in western Oregon is in Appendix B.

Chapter 1 contains a description of the planning area and the purpose and need for the plan and environmental analysis. It also identifies the issues to be resolved, the planning criteria, and describes the relationship of this PRMP/FEIS to other BLM plans, programs, and policies.

Description of the Planning Area

The Medford District's PRMP/FEIS covers approximately 858,127 acres of land located in southwestern Oregon administered by the U.S. Department of the Interior, Bureau of Land Management, Medford District. Within the planning area there are also 4,700 acres of nonfederal surface estate with federal subsurface mineral estate administered by BLM (see Table 1-1).

The planning area, located in southwestern Oregon, includes portions of the Cascade and Siskiyou mountain ranges. The land is predominantly forested with Douglas-fir and other conifer stands, and drains into the Rogue, Klamath, and Umpqua river basins. Populations are centered in and near Grants Pass, Medford, and Ashland.

Portions of the Siskiyou, Rogue River, and Umpqua National Forests are other major federal lands within the planning area.

Table 1-1. BLM-Administered Land within the Planning Area

	Acres				
County	O&C[1]	Public Domain	RWSR[2]	Total Surface	Reserved Minerals[3]
Coos	1,840	0	0	1,840	0
Curry	33,020	40	2,260	35,320	0
Douglas	75,740	3,030	0	78,770	0
Jackson	393,960	55,638	0	449,598	4,352
Josephine	252,130	38,290	10,330	300,750	320
Total	756,690	96,998	12,590	866,278	4,672

[1] Public lands granted to Oregon and California Company and subsequently revested to the United States.
[2] Rogue Wild and Scenic River Corridor, includes O&C and public domain lands.
[3] Subsurface mineral rights managed by BLM, surface managed by other owner.

Purpose and Need for the Action

This PRMP/FEIS focuses on the 11 key planning issues associated with management of BLM-administered land in the Medford District (see Issues and Concerns in this chapter). The issues were identified through public scoping, which started in September 1987, and internal analysis as described in Chapter 5 and Appendix A. These same 11 issues are being addressed in the five (5) other "western Oregon District's RMPs."

This PRMP/FEIS establishes guidelines for the management of BLM-administered land in the Medford District. It will provide a comprehensive framework for allocating and managing BLM-administered resources in the planning area for the life of the plan, which is expected to be at least ten years, within the principles of multiple-use and sustained-yield. It will supersede and replace the management framework plans (MFPs) for the Josephine and Jackson/Klamath sustained-yield units (SYUs) covering the same area.

As discussed in the *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old growth Forest Related Species within the Range of the Northern Spotted Owl* (hereafter referred to as the SEIS), the PRMP responds to dual needs: the need for forest habitat and the need for forest products.

The need for forest habitat is the need for a healthy forest ecosystem with habitat that will support populations of native species and includes protection for riparian areas and waters. This need was reflected by President Clinton at the April 2, 1993, Forest Conference in Portland, Oregon.

The need for forest products from forest ecosystems is the need for a sustainable supply of timber and other forest products that will help maintain the stability of local and regional economies and contribute valuable resources to the national economy, on a predictable and long-term basis. This need also was reflected by President Clinton at the Forest Conference.

The Proposed Resource Management Plan (PRMP) identified in this document was developed after consideration of the following:

- public comments at open house meetings and in correspondence,
- comments from other government agencies,
- BLM staff analysis of the consequences of alternatives,
- legal mandates of Federal laws and executive orders,
- decisions made in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl* and its Attachment A (hereafter referred to as the SEIS ROD), and
- requirements of Bureau policy.

The management of the O&C lands is governed by a variety of statutes, including the O&C Lands Act, FLPMA, the Endangered Species Act, and the Clean Water Act. The O&C Lands Act requires the Secretary of the Interior to manage O&C lands for permanent forest production, however, such management must also be in accord with sustained-yield principles. Further, that Act requires that management of O&C lands protect watersheds, regulate streamflow, provide for recreational facilities, and contribute to the economic stability of local communities and industries. The Act does not require the Secretary to harvest all old growth timber or all commercial timber as rapidly as possible or according to any particular schedule. The Secretary has discretion to determine how to manage the forest on a sustained-yield basis that provides for permanency of timber production over a long-term period. The Secretary must necessarily make judgments, informed by as much information as possible, about what kind of management will lead to permanent forest production that satisfies the principle of sustained yield.

Lands administered under the O&C Act must also be managed in accordance with other environmental laws such as the Endangered Species Act and the Clean Water Act. Some provisions of these laws take precedence over the O&C Lands Act. For instance, the Endangered Species Act (ESA) requires the Secretary to ensure that management of O&C lands will not likely result in jeopardy to listed species or destruction or adverse modification of critical habitat. The ESA directs the Secretary and all federal agencies to utilize their authorities to carry out programs for the conservation and recovery of listed species. Section 5(a) of the Act also directs: "the Secretary, and the Secretary of Agriculture with respect to the National Forest System, shall establish and implement a program to conserve fish, wildlife, and plants, including those which are listed as endangered species or threatened species pursuant to Section 4 of this Act." 16 U.S.C. § 1534(a). Although several northern spotted owl recovery plans have been proposed, the Secretary has not yet adopted final recovery plans for either the northern spotted owl or the marbled murrelet. The SEIS ROD's late-successional and riparian reserve concepts are important building blocks in the development of recovery plans to achieve the conservation and recovery of those species.

One of the purposes of the Endangered Species Act is the preservation of ecosystems upon which endangered and threatened species depend. A forward-looking land management policy would require that federal lands be managed in a way to minimize the need to list species under the ESA. Additional species listings could have the effect of further limiting the O&C Lands Act's goal of achieving and maintaining permanent forest production. This would contribute to the economic instability of local communities and industries in contravention of a primary objective of Congress in enacting the O&C Lands Act. That Act does not limit the Secretary's ability to take steps now that would avoid future listings and additional disruptions.

Protection of watersheds and regulating streamflow are explicit purposes of forest production under the O&C Lands Act. Riparian reserves including those established on O&C lands under the PRMP are designed to restore and maintain aquatic ecosystem functions. Together with other components of the aquatic conservation strategy, riparian reserves will provide substantial watershed protection benefits. Riparian reserves will also help attain and maintain water quality standards, a fundamental aspect of watershed protection. Both riparian reserves and late-successional reserves will help regulate streamflows, thus moderating peak streamflows and attendant adverse impacts to watersheds.

Relationship of the PRMP to BLM Policies, Programs, and Other Plans

Western Oregon BLM Districts are developing RMPs concurrently with this one, and together will cover all BLM-administered lands in western Oregon. Some lands administered by the Roseburg District to the north, the Ukiah, California District to the south, and the Lakeview District to the east, adjoin lands addressed in this plan. Lands administered by the Coos Bay District, but located within the Josephine SYU in the Illinois Valley, are included in the Medford District planning area. Cooperation is occurring in the planning process for management of these lands.

Portions of the Rogue River were designated components of the national wild and scenic rivers system by the original Wild and Scenic Rivers Act of 1968. The 20-mile wild section and the 27-mile recreational section are managed under separate river management plans. These river management plans are currently being updated. The allocation of BLM-administered lands, consistent with the Congressional designation, would not be changed by any of the alternatives.

The Draft RMP/EIS was supplemented by the SEIS. The SEIS ROD, signed jointly by the Secretary of the Interior and the Secretary of Agriculture, requires the Bureau to incorporate the land-use allocations and standards and guidelines in that decision in the Bureau's RMPs for western Oregon. The Proposed RMP is intended to be consistent with the SEIS ROD; any apparent inconsistencies are oversights or misinterpretations of SEIS ROD language. The Final SEIS describes the environmental impacts which arise from those directions. This Final EIS for the RMP incorporates the analysis in that Final SEIS.

This RMP/EIS is also tiered to the 1993 EIS, Pacific Yew, prepared by the U.S. Forest Service, with BLM as a cooperating agency, regarding analysis of impacts of harvest of Pacific yew. A copy of the key elements of the ROD for that EIS is included in Appendix C of this document. The decisions made in that ROD are not readdressed.

In 1987, BLM completed a record of decision (ROD) for its *Northwest Area Noxious Weed Control EIS*. A copy of key elements from that ROD is included in Appendix 1-C, Draft RMP. This PRMP/FEIS is tiered to that EIS, and the decisions made in that ROD is not readdressed in this document.

This PRMP/FEIS is similarly tiered to BLM's 1989 *Western Oregon-Management of Competing Vegetation EIS* for analysis of impacts of vegetation management activities on human health, and all other impacts from the use of herbicides, in management programs other than noxious weed control. A copy of the key elements of the ROD for that EIS is included in Appendix 1-D, Draft RMP. The decisions made in that ROD are not readdressed in this document.

Any finding made in the record of decision for this RMP/EIS that certain river segments studied herein are suitable for designation under the Wild and Scenic Rivers Act will be a preliminary administrative finding. It will receive further review and possible modification by the Director of BLM, Secretary of the Interior, or the President of the United States. To facilitate that review, after completion of this RMP and its record of decision, the BLM may elect or be required to prepare a study report to support recommendations to Congress for designation of specific rivers or river segments. Final decisions have been reserved by Congress unless the Governor nominates a river to the Secretary of the Interior, who may then decide to designate it.

In September 1984, BLM approved a ROD for the Medford Grazing Management Final EIS. The Rangeland Program Summary (RPS), which documents those decisions as well as subsequent revisions, is shown in Appendix 1-E, Draft RMP. This document is tiered to that Final EIS and the decisions shown in the Rangeland Program Summary. Management of livestock is not addressed in this PRMP/FEIS, except two administrative concerns presented in Chapter 2 in the PRMP section.

Planning Process Overview

BLM's resource management planning process consists of nine steps as described below.

Step 1: Issue Identification

This planning step is designed to identify major problems, concerns, or opportunities associated with the management of public land in the planning area. Issues are identified by the public, the BLM, and other governmental entities. The planning process is focused on the identified planning issues.

Step 2: Planning Criteria

Planning criteria include policies, laws, regulations, and guidelines for resolving issues, developing alternatives, and choosing a proposed plan.

Step 3: Inventory and Data Collection

Certain kinds of biological, physical, social, or economic information needed to resolve the planning issues is collected and analyzed. Inventory information was also used to determine how BLM-administered resources would respond under each alternative.

Step 4: Analysis of the Management Situation

The analysis of the management situation (AMS) identifies the ways lands are currently managed in the planning area and identifies opportunities to manage these lands differently.

Step 5: Formulation of Alternatives

BLM formulates a range of alternatives for managing resources in the planning area. A range of alternatives is developed to resolve significant planning issues and address specific management concerns. Alternatives include a preferred plan, management direction common to all alternatives, alternative plans, and no action (current management).

Step 6: Estimation of Effects

This step involves estimating the environmental effects of implementing each of the alternatives. Effects are estimated in order to provide a comparative evaluation of impacts in compliance with CEQ regulations for implementing NEPA (40 CFR 1500).

Step 7: Selection of the Preferred Alternative

BLM identifies a Preferred Alternative (PA). The Draft RMP/EIS is then prepared and distributed for public review.

Step 8: Selection of Resource Management Plan

Following review and analysis of public comments on the Draft RMP/EIS, BLM selects a proposed resource management plan and publishes the Proposed RMP and Final EIS (PRMP/FEIS). We are currently at this point in the planning process. Decisions become final after a 30-day protest period following publication of the PRMP/FEIS. BLM then publishes the record of decision (ROD) and prepares the Approved Resource Management Plan.

Step 9: Monitoring and Evaluation

This step involves the collection and analysis of resource condition and trend data to ensure the plan is achieving its objective of resolving the identified issues and achieving other desired results. Monitoring continues from the time the PRMP/FEIS is adopted until changing conditions require revision of the whole plan or any portion of the plan.

Publication of this document constitutes completion of Step 8. Public involvement has occurred at several steps in the process (see Chapter 5). A summary of the AMS was published in February 1991. Where BLM manages the subsurface mineral estate and the surface is nonfederal or administered by another federal agency, the PRMP/FEIS addresses only the management of the BLM-administered mineral resources.

Planning Criteria

Planning criteria sets out the legal parameters and management goals that guide and direct the preparation of the PRMP/FEIS. The criteria were developed by BLM and reviewed by the public. One of the primary purposes of planning criteria is to assure that the planning process stays focused on the planning issues. The final approved planning criteria are shown in Appendix D. These planning criteria have been referred to as State Director Guidance.

Issues and Concerns

The alternatives addressed in the *Supplemental EIS on Management of Habitat for Late-Successional and Old growth Related Species Within the Range of the Northern spotted Owl*, but not selected in the Record of Decision for that EIS, were eliminated from district-specific study because they were adequately considered in that Supplemental EIS.

A number of issues and concerns were identified through early phases of public involvement. Of particular relevance were public responses to a scoping mailer of September 1986.

Early in the planning process, the public and BLM employees were invited to help the Medford District identify planning issues and concerns relating to the management of public lands in the planning area. Based on a review of those comments, the following planning issues and concerns emerged. They formed the foundation of planning criteria and alternatives.

1. Timber Production Practices: Which forestland should be available for intensive management of timber products and what practices should be used on those lands?

2 and 3. Old Growth Forests and Habitat Diversity: To what extent and where should old growth and/or mature forest habitats be retained, be maintained, or be reestablished to meet various resource objectives? To what extent and where should BLM manage habitat to support populations of native wildlife species?

4. Threatened and Endangered (and Other Special Status) Species Habitat: What should BLM do to manage federally listed, threatened, or endangered plants and animals and to prevent future federal listing of plants and animals as threatened or endangered species?

5. Special Areas: What areas on public lands need special management to prevent irreparable damage to important historic, cultural, or scenic values; to protect native American traditional use areas; to protect botanical or fish and wildlife resources or other natural systems or processes; and, to protect life and safety from natural hazards? Which of these areas should be formally designated as areas of critical environmental concern (ACEC)?

6. Visual Resources: Which, if any, areas of BLM lands should be managed to reduce visual impacts or enhance visual (scenic) quality?

7 and 8. Stream/Riparian/Water Quality: Where and how should riparian zones be managed to protect and improve water quality, fisheries, and wildlife habitat? What should BLM do to manage for special needs such as municipal and domestic use?

9. Recreation Resources: What areas or sites should be designed and/or managed to protect or enhance a variety of recreational opportunities?

9a. Wild and Scenic Rivers: Which rivers, if any, should be found suitable for designation?

10. Land Tenure: In which areas would BLM-administered lands be sold, exchanged, or transferred out of federal ownership to improve management efficiency and benefit resource program objectives? In which areas would BLM attempt to acquire lands to improve management efficiency and benefit resource program objectives?

11. Rural Interface Area Management: Which BLM-administered lands should be allocated to receive special management practices due to concerns of residents who live in close proximity? Rural interface areas (RIAs) are areas where BLM-administered lands are adjacent to or mingled with the privately owned lands where county zoning has created or allows for creation of lots as small as 1-20 acres. In most RIAs, concerns of the residents are related to forest and range management practices, visual quality, and potential effects on domestic water sources and water supplies.

Issues, Concerns, and Other Planning Considerations Eliminated from Detailed Study

The alternatives addressed in the SEIS but not selected in the SEIS ROD were eliminated from district-specific study because they were adequately considered in the SEIS.

The following issues, topics, or effects were eliminated from consideration as primary factors in the formulation of alternatives for the reasons cited.

- **Grazing/range management:** The Medford District Grazing Management EIS and ROD, completed in 1984, adequately addresses management of livestock in the planning area. An updated version of the Livestock Grazing Rangeland Program Summary is presented in the Draft RMP/EIS, Appendix 1-E.
- **Use of herbicides:** This topic was fully analyzed in BLM's 1989 EIS, Western Oregon Management of Competing Vegetation, and BLM's 1986 EIS, Northwest Area Noxious Weed Control, as supplemented in 1987.
- **Effects on wilderness:** The effects of land uses on identified wilderness values were fully analyzed in BLM's 1989 Oregon Wilderness EIS.
- **Effects on agriculture:** BLM activities in the planning area are not expected to have measurable effects on agriculture.
- **Effects on wind and hydropower resources:** There are no known wind power or hydropower proposals affecting BLM-administered land in the planning area.
- **Effects on prime and unique farmlands and paleontological resources:** No discernible effects are anticipated.
- **Effects on off-reservation Indian tribal treaty rights or trust resources:** No such treaty rights or trust resources involve BLM-administered lands in the Medford District.
- **Effects on energy use:** Previous analyses (e.g., the Josephine and Jackson/Klamath Timber Management EISs) have shown that effects of BLM management activities in the planning area are not significant.

Western Oregon Digital Data Base

To assist the planning process, BLM developed the western Oregon digital data base (WODDB), a geographic information system (GIS) digital (computer) data base.

Due to the checkerboard pattern of land ownership, base thematic data was mapped on a total of seven million acres to obtain coverage of BLM's 2.4 million acres within western Oregon. All base themes were derived from 1985-86 aerial photography and then digitized at 1:4,800 scale. Base data themes include transportation, gross vegetation, hydrology, topography, and cultural features. This information was mapped using automated digitizing system (ADS) software. Resource data themes were mapped at a scale of 1:12,000 or more, depending on the theme. There are approximately 75 resource themes captured on the 2.4 million acres of BLM-administered land. They include soils, forestry, big game, minerals, watersheds, northern spotted owls, and recreation. It is anticipated that additional themes would be added to meet future day-to-day resource management operational needs. The maps used in this planning document were generated from GIS.

Although the majority of western Oregon is covered within the planning area, thirteen townships in the Medford District with only minor acreage of BLM-administered land were excluded from the WODDB project. Slight variation exists in acreage figures used in this document based upon which GIS theme is being analyzed. However, the discrepancy is considered slight on a planning areawide basis.

To build the WODDB data base, standards for each of the themes were developed and agreed upon by BLM's western Oregon Districts. All data themes are standard from district to district.

There are actually two WODDB data bases: one for preparing the western Oregon RMPs, in which the data is "frozen" in time, and one for operational use, in which the data will be updated regularly. Updating the WODDB data is important because of the frequency of changes for many of the resource themes, particularly roads and operations inventory.

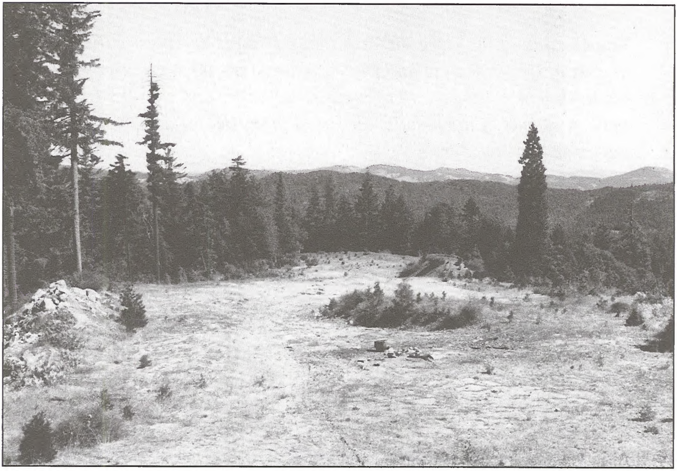
The WODDB data base has been used in three ways.

1. To compute and aggregate resource data for each planning area and display maps of that data.

2. To help design alternatives in accordance with State Director Guidance and to display maps of those alternatives.

3. To facilitate analysis of some of the consequences of those alternatives.

Chapter 2
Alternatives



Mission and Philosophy of Oregon/Washington BLM

The Mission of the Oregon/Washington BLM is to enhance the quality of life of present and future generations through innovative leadership in management of natural resources and stewardship of the ecosystems of the pacific northwest in particular and the global environment in general.

We are committed to functioning with technical excellence, fiscal responsibility and human sensitivity in fulfilling the following objectives:

- *Instilling a stewardship ethic for conservation and prudent use of the land and its resources;*
- *Promoting public partnerships and global policies which sustain health and diversity of the ecosystems;*
- *Fostering social and economic responsibility in the use and management of lands and resources;*
- *Making a positive difference with our natural and human resources; and*
- *Creating a diverse work force which contributes to individual growth while serving our mission.*

Summary of Major Changes

The Preferred Alternative (PA) from the Draft RMP\EIS has been revised based upon public comment, internal analysis, and the SEIS and is now referred to as the Proposed Resource Management Plan (PRMP).

Decisions made in the ROD on the Final Supplemental Environmental Impact Statement (FSEIS), have been incorporated into the Proposed Resource Management Plan (see Appendix E).

The description of the proposed resource management plan includes the objectives, land use allocations, and management actions/direction in one location for reader convenience.

The management actions/direction addressing preparation of watershed management plans for priority watersheds, fisheries management plans and many other management plans are omitted. The requirement for watershed analysis eliminates the need for most individual management plans.

Major allocations from the Preferred Alternative of the Draft RMP/EIS are presented only in Table S-1 for comparative purposes.

Introduction

Chapter 2 contains seven alternatives which, if implemented, provide a mix of uses and actions that could resolve the issues described in Chapter 1. As stated earlier, Chapter 2 has been extensively reorganized. The Preferred Alternative (PA) presented in the Draft RMP/EIS has been modified based upon public comments, internal review, and the ROD on the FSEIS; the PA has been renamed the Proposed Resource Management Plan (PRMP).

An introductory section has been added to explain the goal or vision of the PRMP and to describe the overall BLM western Oregon and district strategy. It also describes implementation, the need for further planning and environmental analysis, and adaptive management all of which are crucial for implementation of the PRMP. The PRMP has been further reorganized by Land Use Allocations, Management Actions/Direction, and a new category, Objectives. The PRMP also incorporates relevant portions of management direction common to the other alternatives. The PRMP is followed by Management Direction Common to Alternatives NA-E, and then Alternatives NA-E. These latter sections have undergone few, if any, changes from the Draft RMP/EIS.

Maps depicting the various proposed decisions for the PRMP have been updated and clarified. Maps displaying the major land use allocations for Alternatives A-E have not been reproduced. Table S-1, in the Summary, includes a reproduction of major allocations/decisions from the Preferred Alternative of the Draft RMP/EIS for comparison purposes only.

The Proposed RMP

Introduction

The proposed resource management plan (PRMP) was developed partially in response to public comments related to the Bureau of Land Management's August 1992 Draft Resource Management Plan for western Oregon and comments specific to the Medford District. In addition the proposed plan incorporates the land use allocations and management direction from the SEIS ROD.

Two maps showing the land allocations of the PRMP on a western Oregon wide basis are the western Oregon planning strategy (Map 2-1); the existing and suitable wild, scenic, and/or recreation rivers, wilderness areas; and wilderness study areas and instant study areas (Map 2-3). District-specific allocations are shown on a variety of maps found in the map packet.

The first part of the Proposed Resource Management Plan (PRMP) essentially addresses or readdresses issues analyzed in the SEIS and decisions documented in the ROD on the FSEIS (see Appendix E). The second part of the PRMP primarily addresses issues specific to the Medford District, but incorporates relevant guidance from the ROD on the FSEIS. This has resulted in a substantial amount of duplication but should result in more consistent implementation.

There are a number of other discussions (e.g., use of the plan, watershed analysis, adaptive management, management assessments and plans, etc.) located near the end of Chapter 2 that

also have an important bearing on the implementation on the PRMP. These sections should be reviewed to obtain a better understanding of the entire Resource Management Plan. While not required by the ROD on the SEIS or this document, it is assumed that watershed analysis will eventually be completed for the entire planning area. Watershed analysis will help guide implementation of the RMP in many important aspects.

Vision

The Bureau of Land Management (BLM) will manage the natural resources under its jurisdiction in western Oregon to help enhance and maintain the ecological health of the environment and the social well being of human populations.

There are several basic principles supporting this vision:

- natural resources can be managed to provide for human use and a healthy environment;
- resource management must be focused on ecological principles to reduce the need for single resource or single species management;
- stewardship, the involvement of people working with natural processes, is essential for successful implementation;
- the BLM cannot achieve this vision alone but can, by its management processes and through cooperation with others, be a significant contributor to its achievement; and
- a carefully designed program of monitoring, research and adaptation will be the change mechanism for achieving this vision.

Strategy

Lands administered by the BLM will be managed to maintain or restore healthy, functioning ecosystems while providing a sustainable production of natural resources. This management strategy, titled ecosystem management, involves the use of ecological, economic, social, and managerial principles to ensure the sustained condition of the whole. Ecosystem management emphasizes the complete ecosystem instead of individual components and looks at sustainable systems and products that people want and need. It seeks a balance between maintenance and restoration of natural systems and sustainable yield of resources.

The building blocks for this strategy are comprised of several major land use allocations: riparian reserves; late-successional reserves; adaptive management areas; matrix, which includes general forest management areas and connectivity/diversity blocks; and a variety of special purpose management areas such as recreation sites, wild and scenic rivers, and visual resource management areas. These land use allocations are located and configured in the landscape to support overall ecosystem function and to meet the vision for management of federal lands in western Oregon.

Each land use allocation will be managed according to specific objectives and management actions/direction. During initial implementation of the plan, the stated objectives and management actions/direction will provide the rules and limits governing actions and the principles specifying the environmental conditions or levels to be achieved and maintained. As BLM gains experience in implementing the plan and applying the concepts of adaptive management, the stated objectives and management actions/direction will be refined for specific geographic areas.

There are two major management concepts underlying the objectives and management actions/direction: ecological principles for management of late-successional forests and the Aquatic Conservation Strategy. These concepts are summarized below. See Appendix E for a more detailed description of these concepts.

Ecological Principles for Management of Late-Successional Forests

One goal of this plan is to maintain late-successional and old growth species habitat and ecosystems on federal lands. A second goal is to maintain biological diversity associated with native species and ecosystems in accordance with laws and regulations.

All land use allocations described in this plan will contribute to these two goals. For instance, late-successional and riparian reserves and many special management areas (e.g., areas of critical environmental concern) will be managed to enhance and/or maintain late-successional forest conditions.

The general forest management area and connectivity/diversity blocks will be managed to retain late-successional forest legacies (e.g., coarse woody debris, green trees, snags, and late-successional forest patches). These and other land use allocations and resource programs are described in detail below.

Aquatic Conservation Strategy

The aquatic conservation strategy was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems contained within them on public lands. The strategy would protect salmon and steelhead habitat on federal lands managed by the Forest Service (FS) and Bureau of Land Management (BLM) within the range of the Pacific Ocean anadromy.

The aquatic conservation strategy is designed to meet the following objectives:

- Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic systems to which species, populations and communities are uniquely adapted.
- Maintain and restore spatial and temporal connectivity within and between watersheds. Lateral, longitudinal, and drainage network connections include floodplains, wetlands, up slope areas, headwater tributaries, and intact refugia. These lineages must provide chemically and physically unobstructed routes to areas crucial for fulfilling life history requirements of aquatic and riparian-dependent species.
- Maintain and restore the physical integrity of the aquatic system, including shorelines, banks, and bottom configurations.
- Maintain and restore water quality necessary to support healthy riparian, aquatic, and wetland ecosystems. Water quality must remain in the range that maintains the biological, physical, and chemical integrity of the system and benefits survival, growth, reproduction, and migration of individuals composing aquatic and riparian communities.
- Maintain and restore the sediment regime under which an aquatic ecosystem evolved. Elements of the sediment regime include the timing, volume, rate, and character of sediment input, storage, and transport.
- Maintain and restore instream flows sufficient to create and sustain riparian, aquatic, and wetland habitats and to retain patterns of sediment, nutrient, and wood routing (i.e., movement of woody debris through the aquatic system). The timing, magnitude, duration, and spatial distribution of peak, high, and low flows must be protected.
- Maintain and restore the timing, variability, and duration of floodplain inundation and water table elevation in meadows and wetlands.
- Maintain and restore the species composition and structural diversity of plant communities in riparian areas and wetlands to provide adequate summer and winter thermal regulation, nutrient filtering, appropriate rates of surface erosion, bank erosion, and channel migration and to supply amounts and distributions of coarse woody debris sufficient to sustain physical complexity and stability.
- Maintain and restore habitat to support well-distributed populations of native plant, invertebrate, and vertebrate riparian-dependent species.

The components of the aquatic conservation strategy objectives are riparian reserves, key watersheds, watershed analysis, and watershed restoration.

Riparian Reserves

See Riparian Reserves in the Land Use Allocation section.

Key Watersheds

A system of key watersheds that serve as refugia is crucial for maintaining and recovering habitat for at-risk stocks of anadromous salmonids and resident fish species. These refugia include areas of high quality habitat and areas of degraded habitat. Key watersheds with high quality conditions will serve as anchors for the potential recovery of depressed stocks. Those of lower quality habitat have high potential for restoration and will become future sources of high quality habitat with the implementation of a comprehensive restoration program.

There are two types of key watersheds: Tier 1 and Tier 2. Tier 1 watersheds contribute directly to conservation of at-risk anadromous salmonids, bull trout, and resident fish species. They also have a high potential of being restored as part of a watershed restoration program. Tier 2 watersheds do not contain at-risk fish stocks, but they are important sources of high quality water.

All or a portion of the following key watersheds are located within the planning area.

Key Watershed Name	BLM Acres
Beaver Creek	2,710
Cave/Grayback Creeks	40
Elk Creek	21,660
Indigo Creek	270
Jenny Creek	45,370
Little Applegate River	1,720
Middle Creek	190
Palmer Creek	430
South Fork/North Fork Little Butte Creek	26,900
South Fork Coquille River	140
South Umpqua River	190
Silver Creek	8,490
Taylor Creek	1,880
Upper Sucker Creek	1,330
West Fork Cow Creek	26,410
Yale Creek	1
Total	137,730

NOTE: All key watersheds in the Medford District are Tier 1.

See Map 2-1 for locations of key watersheds.

Key watersheds overlay portions of all land use allocations in the district and place additional management requirements or emphasis on activities in those areas.

Management Actions/Direction

- Prepare watershed analyses prior to further resource management activity, including timber harvest in key watersheds. Until watershed analyses can be completed, proceed with minor activities, such as those categorically excluded under the National Environmental Policy Act regulations (except timber harvest), if they are consistent with aquatic conservation strategy and riparian reserve objectives. Apply riparian reserve management actions/direction.
- Reduce existing system and nonsystem road mileage outside roadless areas. If funding is insufficient to implement reductions, there will be no net increase in the amount of roads in key watersheds.
- Give highest priority to watershed restoration in key watersheds.

Watershed Analysis

See Watershed Analysis section (toward the end of this chapter) and Appendix E for requirements.

Watershed Restoration

Watershed restoration will be an integral part of a program to aid recovery of fish habitat, riparian habitat, and water quality. The most important components of a watershed restoration program are control and prevention of road-related runoff and sediment production, restoration of the condition of riparian vegetation, and restoration of in-stream habitat complexity. Other restoration opportunities include meadow and wetland restoration and mine reclamation.

Management Actions/Direction

- Prepare watershed analyses prior to restoration activities. See Use of the Plan section.
- Focus watershed restoration on removing and upgrading roads.
- Apply silvicultural treatments to restore large conifers in riparian reserves.
- Restore stream channel complexity. In-stream structures will only be used in the short term and not as a mitigation measure.

Additional information about the aquatic conservation strategy and riparian reserve objectives are found in Appendix E.

Land Use Allocations and Resource Programs

Introduction

This section provides a description of objectives, land use allocations, and management actions/direction for this PRMP. The term "land use allocations" is used in two ways. First, it pertains to the major land use allocation categories derived from the SEIS ROD (e.g., riparian reserves and late-successional reserves) and the still relevant allocations from the Medford District Draft RMP. The second use pertains to data and text describing specific allocations (e.g., acres, miles, and number of sites) under each land use allocation and resource program category.

This section has three major parts:

- management actions/direction for all land use allocations and resource programs;
- specific land use allocations: objectives, allocations, and management actions/direction for each category; and
- resource programs: objectives, allocations, and management actions/direction for each category.

Although described separately, each of these elements contributes collectively and cumulatively to meeting the overall management strategy and must be considered together to accurately reflect the concept of ecosystem management. There is some duplication of objectives and management actions/direction for land use allocations and resource programs. A reader interested in either topic will find a basic package of related management guidance in one location.

The hierarchy in the PRMP for specific land use allocations and resource programs will generally emulate the following examples:

Riparian Reserve
    Objective(s)
    Land Use Allocation(s)
    Management Actions/Direction
    -
    - (Varies by major heading)
    -

Special Areas
    Objective(s)
    Land Use Allocation(s)
    Management Actions/Direction
    -
    - (Varies by major heading)
    -

Most resource programs have basic requirements for activities such as inventory, site-specific analysis, planning, and environmental assessment prior to project implementation and monitoring after project implementation. Inherent in the proposed resource management plan is a BLM commitment to continue these activities in the future. For the sake of simplifying text, these activities are generally not repeated in the management actions/directions sections that follow.

A summary of the land use allocations and management actions/direction for the proposed resource management plan is found in Table S-1. Land use allocations are shown on the chapter 2 maps in the accompanying packet.

Management Actions/Direction for all Land Use Allocations and Resource Programs

The SEIS ROD provides guidance for six topics that apply to all land use allocations. Guidance for four of these topics is found under Recreation, Fire Management, Livestock Grazing, and in the Research section (toward the end of this Chapter). Guidance for the other two topics (Survey and Manage Strategy and Protection Buffers) is described below.

All management actions/direction in this proposed resource management plan are subject to refinement through planning based on watershed analysis and the adaptive management process. In some areas, land use allocations overlap. A hierarchy of allocations and related management actions/direction will be used to guide plan implementation (see Appendix E, Hierarchy of Standards and Guidelines).

Survey and Manage for Amphibians, Mammals, Bryophytes, Mollusks, Vascular Plants, Fungi, Lichens, and Arthropods

For species listed in Appendix G (see that portion abstracted from Table C-3, SEIS ROD), apply the survey and manage guidance within the range of the species and within the particular habitats that they are known to occupy. There are four survey strategies indicated. Application of these strategies and priorities vary by species.

Survey Strategy 1: Manage known sites (highest priority).

- Acquire information on these sites, make it available to all project planners, and use it to design or modify activities.

- Protect known sites. For some species, apply specific management treatments such as prescribed fire, to maintain habitat value.

- For rare and endemic fungus species, temporarily withdraw 160 acres around known sites from ground-disturbing activities until the sites can be thoroughly surveyed and site-specific measures prescribed.

Survey Strategy 2: Survey prior to ground-disturbing activities and manage sites.

- Continue existing efforts to survey and manage rare and sensitive species habitat.

- For species without survey protocols, start immediately to design protocols and implement surveys.

- Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species, survey for Allotropa virgata, Bensoniella oregana, Cypripedium fasciculatum and Cypripedium montanum. Survey for Del Norte salamanders, Siskiyou Mountain salamanders, and red tree voles. These surveys will precede the design of all ground-disturbing activities to be implemented in 1997 or later.

- For the other species listed in Appendix G, begin development of survey protocols promptly and proceed with surveys as soon as possible. These surveys will be completed prior to ground-disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the FSEIS.

- Conduct surveys at a scale most appropriate to the species.

- Develop management actions/direction to manage habitat for the species on sites where they are located.

- Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.

Survey Strategy 3: Conduct extensive surveys and manage sites.

- Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to ground-disturbing activities are not a requirement.

- Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.

- Design these surveys for efficiency and develop standardized protocols.

- Begin these surveys by 1996.

Survey Strategy 4: Conduct general regional surveys.

- Survey to acquire additional information and to determine necessary levels of protection for arthropods, bryophytes, lichens, and fungi species that were not classed as rare and endemic.

- Initiate these surveys no later than Fiscal Year 1996 and complete them within 10 years.

Protection Buffer Species

Provide protection buffers for specific rare and locally endemic species and other species in the upland forest matrix. A list of these species and related management actions/direction are presented in Appendix G. These species are likely to be assured viability if they occur within reserves. However, there might be occupied locations outside reserves that will be important to protect as well.

Apply the following management actions/direction:

- Develop survey protocols that will ensure a high likelihood of locating sites occupied by these species.

- Following development of survey protocols and prior to ground-disturbing activities, conduct surveys within the known or suspected ranges of the species and within the habitat types or vegetation communities occupied by the species. See the previous Survey and Manage section for an implementation schedule.

- When located, protect the occupied sites.

See Special Status and SEIS Special Attention Species section for additional details.

Specific Land Use Allocations

This section describes specific land use allocations developed for the SEIS ROD.

Riparian Reserves

Objectives

See Aquatic Conservation Strategy objectives.

Provide habitat for terrestrial species associated with late-successional forest habitat.

Provide dispersal habitat for northern spotted owls.

Implement strategies to achieve the goals established in the BLM's Riparian Wetland Initiative for the 1990s.

Land Use Allocations

There are approximately 369,200 acres of riparian reserves in the planning area. Calculation of these acres is based on prescribed widths and estimated miles of stream in the various land use categories described in the SEIS ROD. The widths are intended to provide a high level of fish, wildlife and plant habitat and riparian protection until watershed and site analysis can be completed. Although riparian reserve boundaries on permanently flowing streams may be adjusted, they are considered to be the approximate widths necessary for attaining aquatic conservation strategy and riparian reserve objectives. Post-watershed analysis riparian reserve boundaries for permanently flowing streams will approximate the boundaries described below. Following watershed analysis, riparian reserve boundaries for intermittent streams may be different from the existing boundaries. Determination of final boundaries will be based on hydrologic, geomorphic, and ecologic processes in a watershed affecting intermittent streams. The widths of riparian reserves apply to all watersheds until watershed analysis is completed, a site-specific analysis is conducted and described, and the rationale for final riparian reserve boundaries is presented through the appropriate National Environmental Policy Act decision-making process, and are subject to review by the Regional Ecosystem Office. Watershed analysis should also take into account all species that were intended to be benefitted by the prescribed riparian reserve widths, including fish, mollusks, amphibians, lichens, fungi, bryophytes, vascular plants, American martens, red tree voles, bats, marbled murrelets, and northern spotted owls.

The initial riparian reserve widths are as follows:

Fish-bearing streams. Riparian reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance (600 feet total, including both sides of the stream channel), whichever is greatest.

Permanently flowing nonfish-bearing streams. Riparian reserves consist of the stream and the area on each side of the stream extending from the edges of the active stream channel to the top of the inner gorge, or to the outer edges of the 100-year floodplain, or to the outer edges of riparian vegetation, or to a distance equal to the height of one site-potential tree, or 150 feet slope distance (300 feet total, including both sides of the stream channel), whichever is greatest.

Seasonally flowing or intermittent streams, wetlands less than one acre, and unstable and potentially unstable areas. This category applies to features with high variability in size and site-specific characteristics. At a minimum the riparian reserves will include:

- The extent of unstable and potentially unstable areas;
- The stream channel and the area extending to the top of the inner gorge;
- The stream channel or wetland and the area from the edges of the stream channel or wetland to the outer edges of the riparian vegetation; and
- The area extending from the edges of the stream channel to a distance equal to the height of one site-potential tree, or 100 feet slope distance, whichever is greatest.

Constructed ponds and reservoirs, and wetlands greater than one acre. Riparian reserves consist of the body of water or wetland and the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of one site-potential tree, or to 150 feet slope distance from the edge of a wetland greater than one acre or the maximum pool elevation of constructed ponds and reservoirs, whichever is greatest.

Lakes and Natural Ponds. Riparian reserves consist of the body of water and the area to the outer edges of the riparian vegetation, or to the extent of seasonally saturated soil, or to the extent of unstable and potentially unstable areas, or to a distance equal to the height of two site-potential trees, or 300 feet slope distance, whichever is greatest.

A site-potential tree height is the average maximum height of the tallest dominant trees (200 years or older) for a given site class.

Intermittent streams are defined as any nonpermanent flowing drainage feature having a definable channel and evidence of annual scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two physical criteria.

Management Actions/Direction

As a general rule, management actions/direction for riparian reserves prohibit or regulate activities that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. Watershed analysis and appropriate National Environmental Policy Act compliance will be required to change riparian reserve boundaries in all watersheds.

Implement the following management actions/ direction in riparian reserves. (Management actions/ direction in this section are supplemented by Best Management Practices in Appendix F.)

Management Actions/Direction - General

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Management Actions/Direction - Timber Management

Prohibit timber harvest including fuelwood cutting in riparian reserves, with the following exceptions:

- Where catastrophic events such as fire, flooding, volcanic, wind, or insect damage result in degraded riparian conditions, allow salvage and fuelwood cutting if required to attain aquatic conservation strategy and riparian reserve objectives.
- Remove salvage trees only when watershed analysis determines that present and future woody debris needs are met and other aquatic conservation strategy and riparian reserve objectives are not adversely affected.
- Apply silvicultural practices for riparian reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain aquatic conservation strategy and riparian reserve objectives.

Riparian reserve acres are not included in calculations of the probable sale quantity.

Management Actions/Direction - Roads Management

Cooperate with federal, state, and county agencies and work with private parties with road use agreements to achieve consistency in road design, operation, and maintenance necessary to attain aquatic conservation strategy and riparian reserve objectives.

For each existing or planned road, meet aquatic conservation strategy and riparian reserve objectives by:

- completing watershed analyses including appropriate geotechnical analyses (i.e., examining soil and rock conditions in riparian areas at proposed stream crossings) prior to construction of new roads or landings in riparian reserves;
- minimizing road and landing locations in riparian reserves;
- preparing road design criteria, elements, and standards that govern construction and reconstruction;
- preparing operation and maintenance criteria that govern road operation, maintenance, and management;
- minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow;
- restricting sidecasting as necessary to prevent the introduction of sediment to streams; and
- avoiding wetlands entirely when constructing new roads.

Determine the influence of each road on the aquatic conservation strategy and riparian reserve objectives through watershed analysis. Meet aquatic conservation strategy and riparian reserve objectives by:

- reconstructing roads and associated drainage features that pose a substantial risk;
- prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected; and
- closing and stabilizing, or obliterating and stabilizing roads based on the ongoing and potential effects to aquatic conservation strategy and riparian reserve objectives and considering short-term and long-term transportation needs.

New culverts, bridges and other stream crossings shall be constructed, and existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions will be improved to accommodate at least the 100-year flood, including associated bedload and debris determined to pose a substantial risk to riparian conditions. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g., streams which can be made available to anadromous fish by removing obstacles to passage).

Develop and implement a road management plan or a transportation management plan that will meet the aquatic conservation strategy and riparian reserve objectives. As a minimum, this plan will include provisions for the following activities:

- inspections and maintenance during storm events;
- inspections and maintenance after storm events;
- road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources;
- traffic regulation during wet periods to prevent damage to riparian resources; and
- establishing the purpose of each road by developing the road management objectives.

Management Actions/Direction - Grazing Management

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.

Locate new livestock handling and/or management facilities outside riparian reserves. For existing livestock handling facilities inside riparian reserves, ensure that aquatic conservation strategy and riparian reserve objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.

Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure aquatic conservation strategy and riparian reserve objectives are met.

Management Actions/Direction - Recreation Management

Design new recreational facilities within riparian reserves, including trails and dispersed sites, so as not to prevent meeting aquatic conservation strategy and riparian reserve objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within riparian reserves, evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable contribute to, attainment of aquatic conservation strategy and riparian reserve objectives.

Adjust dispersed and developed recreation practices that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.

Address attainment of aquatic conservation strategy and riparian reserve objectives in wild and scenic river and wilderness management plans.

Management Actions/Direction - Energy and Minerals Management

NOTE: The standards and guidelines for minerals management in riparian reserves presented on page C-34/35 of the SEIS ROD are not consistent with BLM regulations. Until regulations are modified, management of locatable minerals within riparian reserves will be governed by regulations found in 43 CFR 3809. The following guidelines consistent with 43 CFR 3809, are modifications of the standards and guidelines presented in the SEIS ROD and apply to any locatable mineral operations requiring a plan of operations, and to leasable and saleable mineral operations where appropriate.

- Require a Plan of Operations, including a reclamation plan and reclamation bond for all mining operations in riparian reserves. Such plans and bonds will address the costs of removing facilities, equipment, and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet aquatic conservation strategy and riparian reserve objectives.

- Locate structures, support facilities, and roads outside riparian reserves. If no alternative to siting facilities in riparian reserves exists, locate in a way compatible with aquatic conservation strategy and riparian reserve objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in riparian reserves. When a road is no longer required for mineral or land management activities, it will be reclaimed. In any case, access roads will be constructed consistent with 43 CFR 3809 and acceptable road construction standards and will minimize damage to resources in riparian reserves.

- Avoid locating solid and sanitary waste facilities in riparian reserves. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in riparian reserves exists, if releases can be prevented and stability can be ensured, then:

- Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.

- Locate and design waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in riparian reserves.

- Reclaim waste facilities after operations to ensure chemical and physical stability and to meet aquatic conservation strategy and riparian reserve objectives.

- Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet aquatic conservation strategy and riparian reserve objectives.

- Require reclamation bonds adequate to ensure chemical and physical stability and to meet aquatic conservation strategy and riparian reserve objectives.

- Where an existing operator is in noncompliance at the notice level (i.e., causing unnecessary or undue degradation), require actions similar to those stated above to meet the intent of 43 CFR 3809.

- Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans, leases and permits is needed to eliminate impacts that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.

- For leasable mineral activity in Riparian Reserves, prohibit surface occupancy for oil, gas, and geothermal exploration and development activities where leases do not exist. Where possible, modify the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of aquatic conservation strategy and riparian reserve objectives, consistent with existing lease terms and stipulations.

- Allow development of saleable minerals, such as sand and gravel, within riparian reserves only if aquatic conservation strategy and riparian reserve objectives can be met.

Management Actions/Direction - Fire Management

Design fuel treatment and fire suppression strategies, practices, and activities to meet aquatic conservation strategy and riparian reserve objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.

Locate incident bases, camps, helibases, staging areas, helispots and other centers for incident activities outside of riparian reserves. If the only suitable location for such activities is within the riparian reserve, an exemption may be granted following a review and recommendation by a resource advisor. The advisor will prescribe the location, use conditions, and rehabilitation requirements. Utilize an interdisciplinary team to predetermine suitable incident base and helibase locations.

Minimize delivery of chemical retardant, foam, or other additives to surface waters. An exception may be warranted in situations where overriding immediate safety imperatives exist, or following a review and recommendation by a resource advisor when an escape would cause more long-term damage.

Design prescribed burn projects and prescriptions to contribute to attainment of aquatic conservation strategy and riparian reserve objectives.

Immediately establish an emergency team to develop a rehabilitation treatment plan needed to attain aquatic conservation strategy and riparian reserve objectives whenever riparian reserves are significantly damaged by a wildfire or a prescribed fire burning outside prescribed parameters.

Limit the size of all fires.

Allow some natural fires to burn under prescribed conditions. This decision will be based on watershed analysis and planning.

Consider rapidly extinguishing smoldering coarse woody debris and duff.

Locate and manage water drafting sites (e.g., sites where water is pumped to control or suppress fires) to minimize adverse effects on riparian habitat and water quality as consistent with aquatic conservation strategy and riparian reserve objectives.

Management Actions/Direction - Lands Management

Identify instream flows needed to maintain riparian resources, channel conditions, and fish passage.

Issue leases, permits, rights-of-way, and easements to avoid adverse effects that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. Where legally possible, adjust existing leases, permits, rights-of-way, and easements to eliminate adverse effects that retard or prevent the attainment of aquatic conservation strategy and riparian reserve objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing leases, permits, rights-of-way and easements will be based on the actual or potential impact and the ecological value of the riparian resources affected.

Use land acquisition, exchange, and conservation easements to meet aquatic conservation strategy and riparian reserve objectives and facilitate restoration of fish stocks and other species at risk of extinction. For proposed hydroelectric projects and other surface water development proposals under the jurisdiction of the Federal Energy Regulatory Commission (the Commission), provide timely, written comments regarding maintenance of instream flows and habitat conditions and maintenance/restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of riparian reserves. For existing support facilities inside riparian reserves that are essential to proper management, provide recommendations to the Commission that ensure aquatic conservation strategy and riparian reserve objectives are met. Where these objectives cannot be met, provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the riparian reserves should be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.

For other hydroelectric and surface water development proposals in Tier One key watersheds, require instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds, give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies.

Management Actions/Direction - General Riparian Area Management

Identify and attempt to secure instream flows needed to maintain riparian resources, channel conditions, and aquatic habitat.

Fell trees in riparian reserves when they pose a safety risk. Keep felled trees on site when needed to meet coarse woody debris objectives.

Apply herbicides, insecticides, other toxicants, and other chemicals only in a manner that avoids impacts that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.

Locate water drafting sites to minimize adverse effects on stream channel stability, sedimentation, and instream flows needed to maintain riparian resources, channel conditions, and fish habitat.

Management Actions/Direction - Watershed and Habitat Restoration

Design and implement watershed restoration projects in a manner that promotes long-term ecological integrity of ecosystems, conserves the genetic integrity of native species, and attains aquatic conservation strategy and riparian reserve objectives.

Cooperate with federal, state, local, and tribal agencies, and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet aquatic conservation strategy and riparian reserve objectives.

Prevent watershed and habitat degradation rather than relying on mitigation measures or planned restoration.

Management Actions/Direction - Fish and Wildlife Management

Design and implement fish and wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of aquatic conservation strategy and riparian reserve objectives.

Design, construct and operate fish and wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. For existing fish and wildlife interpretative and other user-enhancement facilities inside riparian reserves, ensure that aquatic conservation strategy and riparian reserve objectives are met. Where aquatic conservation strategy and riparian reserve objectives cannot be met, relocate or close such facilities.

Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of aquatic conservation strategy and riparian reserve objectives.

Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest and poaching that threaten the continued existence and distribution of native fish stocks inhabiting streams with adjacent or nearby federal lands.

Late-Successional Reserves (LSR)

Objectives

Protect and enhance conditions of late-successional and old growth forest ecosystems, which serve as habitat for late-successional and old growth forest-related species including the northern spotted owl and marbled murrelet.

Maintain a functional, interacting, late-successional and old growth forest ecosystem.

Land Use Allocations

There are 211,404 acres of late-successional reserves in the district. The five components of this reserve system are:

- Mapped late-successional reserves:

Area	Acres
Elk Creek LSR	21,594
Azalea LSR	26,394
Galice Block LSR	92,648
Munger Butte LSR/AMR	36,214
Jenny Creek LSR	34,554

Some or parts of the most ecologically significant late-successional forests identified by the Scientific Panel on Late-Successional Forest Ecosystems; and some or parts of the Designated Conservation Areas from the Final Draft Spotted Owl Recovery Plan. These reserves incorporate key watersheds to the extent practicable.

- Late-successional/old growth 1 and 2 areas within marbled murrelet Zone 1, as mapped by the Scientific Panel on Late-Successional Forest Ecosystems.

- Occupied marbled murrelet sites (see Special Status and SEIS Special Attention Species section).

- Known northern spotted owl activity centers. One-hundred acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) northern spotted owl activity centers.

- Protection buffers (see Special Status and SEIS Special Attention Species section).

See Maps 2-2 and 2-8 for locations of late-successional reserves. Known northern spotted owl activity centers and protection buffers are unmapped. There are no occupied marbled murrelet sites within the planning area. Six (6) isolated late-successional old growth one and two (LSOG 1 and 2) areas are located in the extreme western part of the planning area (3,478 acres).

Management Actions/Direction

Management Actions/Direction - General

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Develop late-successional reserve assessments prior to habitat manipulation. See Management Assessments and Plans (toward the end of this chapter) for additional information.

Plan and implement nonsilvicultural activities inside late-successional reserves that are neutral or beneficial to the creation and maintenance of late-successional habitat.

Using interdisciplinary teams, evaluate other activities not described below and document appropriate guidelines.

Request review by the Regional Ecosystem Office of all activities deemed to have potential adverse effects on late-successional reserve objectives. The Regional Ecosystem Office may develop additional criteria for exempting some additional activities from review.

Management Actions/Direction - Silviculture

Plan and implement silvicultural treatments inside late-successional reserves that are beneficial to the creation of late-successional habitat.

If needed to create and maintain late-successional forest conditions, conduct thinning operations in forest stands less than 80 years of age. This will be accomplished by precommercial or commercial thinning of stands regardless of origin (e.g., planted after logging or naturally regenerated after fire or blowdown).

LSRs would be managed to reduce the risk of large scale disturbance such as from wildfire, and the subsequent loss of habitat for old growth associated species.

Management Actions/Direction - Salvage

Limit salvage of dead trees in late-successional reserves to areas where stand-replacing events exceed ten acres in size and canopy closure has been reduced to less than 40 percent.

Retain all standing live trees including those injured (e.g., scorched) but likely to survive.

Retain snags that are likely to persist until late-successional forest conditions have developed and a new stand is again producing large snags.

Retain adequate coarse woody debris quantities in a new stand so that in the future it will still contain amounts similar to naturally regenerated stands. Watershed-level or province-level plans will establish appropriate levels of coarse woody debris to be used. Levels will be typical and will not require retention of all material where it is highly concentrated or too small to contribute to coarse woody debris over the long term.

If an LSR assessment indicates it is essential to reduce future risk of fire or insect damage, conduct salvage that does not meet the preceding management actions/direction. Focus on those areas where there is high risk of large scale disturbance.

Remove snags and logs to reduce hazards to humans along roads and trails and in or adjacent to recreation sites. Leave some material where coarse woody debris is inadequate.

After disturbance in younger stands, develop diameter and biomass retention direction consistent with the intention of achieving late-successional forest conditions. Where green trees, snags, and logs are present following disturbance, the green-tree and snag direction will be applied first and completely satisfied where possible. The biomass left in snags can be credited toward the amount of coarse woody debris biomass needed to achieve management objectives.

Retain logs present on the forest floor before a disturbance event.

Retain coarse woody debris to approximate the species composition of the original stand to help replicate preexisting suitable habitat conditions.

Deviate from these management actions/direction only to provide reasonable access to salvage sites and feasible logging operations. Limit deviations to as small an area as possible.

Management Actions/Direction - Road Construction and Maintenance

Construct roads in late-successional reserves if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, be routed through unsuitable habitat where possible, and be designed to minimize adverse impacts. Alternative access methods, such as aerial logging, will be considered to provide access for activities in reserves.

Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material on site if available coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.

Management Actions/Direction - Fuelwood Gathering

Permit fuelwood gathering only in existing cull decks, in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance from high intensity wildfire. In all cases these activities will comply with management actions/direction for salvage and silvicultural activities.

Management Actions/Direction - Energy and Minerals

Assess the impacts of ongoing and proposed mining activities in late-successional reserves.

Include stipulations in mineral leases and, when legally possible, require operational constraints for locatable mineral activities to minimize detrimental effects to late-successional habitat.

Management Actions/Direction - Developments

Neither construct nor authorize new facilities that may adversely effect late-successional reserves.

Review on a case-by-case basis new development proposals that address public needs or provide significant public benefits. They may be approved when adverse effects can be minimized and mitigated. They will be planned to have the least possible adverse impacts on late-successional reserves.

Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.

Retain and maintain existing developments, such as campgrounds, utility corridors, and electronic sites consistent with other management actions/direction for late-successional reserves.

Remove hazard trees along utility rights-of-way and trails and in other developed areas.

Management Actions/Direction - Land Exchanges

Consider land exchanges in late-successional reserves if they provide benefits equal to or better than current conditions.

Consider land exchanges especially to improve area, distribution, and quality (e.g., connectivity, shape, and contribution to biological diversity) of late-successional reserves, especially where public and private lands are intermingled.

Management Actions/Direction - Habitat Improvement Projects

Design projects to improve conditions for fish, wildlife, special status species, SEIS special attention species, and watersheds if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.

Consider projects required for recovery of threatened or endangered species even if they result in some reduction of habitat quality for other late-successional species.

Design and implement watershed restoration projects consistent with late-successional reserve objectives.

Management Actions/Direction - Livestock Grazing

Through an interdisciplinary process, implement range-related management activities that do not adversely effect late-successional habitat.

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of late-successional reserve objectives.

Evaluate effects of existing and proposed livestock management and handling facilities in late-successional reserves to determine if reserve objectives are met. Where objectives cannot be met, relocate livestock management and/or handling facilities.

Management Actions/Direction - Fire Suppression and Prevention

As part of watershed analysis or late-successional reserve assessments, plan fire management for each late-successional reserve.

Emphasize maintaining late-successional habitat in wildfire suppression plans.

Use minimum impact suppression methods for fuels management in accordance with guidelines for reducing risks of large-scale disturbances.

During actual fire suppression activities, consult an interdisciplinary team or environmental specialist to assure that habitat damage is minimized.

Until a fire management plan is completed for a late-successional reserve or group of reserves, suppress wildfire to avoid loss of habitat and to maintain future management options.

Prepare a specific fire management plan prior to any habitat manipulation activities in late-successional reserves. Specify how hazard reduction and other prescribed fire applications meet the objectives of the late-successional reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office.

Apply prescribed fire in a manner that retains the amount of coarse woody debris determined through watershed analysis.

Limit the size of all fires until assessment or activity plans are completed.

Allow some natural fires to burn under prescribed conditions. This decision will be based on additional analysis and planning.

Consider rapidly extinguishing smoldering coarse woody debris and duff.

Management Actions/Direction - Special Forest Products

Evaluate whether special forest product harvest activities have adverse effects on late-successional reserve objectives.

Prior to selling special forest products, ensure resource sustainability and protection of other resource values such as special status plant or animal species.

Where special forest product activities are extensive, evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.

Management Actions/Direction - Recreational Uses

Use adjustment measures, such as education, use limitations, traffic control devices, or increased maintenance, when dispersed and developed recreation practices retard or prevent attainment of late-successional reserve objectives.

Management Actions/Direction - Rights-of-Way, Contracted Rights, Easements, and Special/Temporary Use Permits

Consider as valid uses access to nonfederal lands through late-successional reserves and existing right-of-way agreements, contracted rights, easements and special/temporary use permits in late-successional reserves.

For all new rights-of-way proposals, design mitigation measures to reduce adverse effects on late-successional reserves. Consider alternative routes that avoid late-successional reserves. If rights-of-way must be routed through a reserve, design and locate them to have the least impact on late-successional habitat.

Review all special/temporary use permits. When objectives of late-successional reserves are not being met, reduce impacts through education or modification of existing permits.

Management Actions/Direction - Nonnative Species

If introduction of a nonnative species is proposed, complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of late-successional objectives.

Evaluate impacts of non-native species (plant and animal) existing within reserves.

Develop plans and recommendations for eliminating or controlling nonnative species which are inconsistent with late-successional reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within late-successional reserves.

Management Actions/Direction - Protection Buffers - see the Special Status and SEIS Special Attention Species section

Establish a 1/4 mile protection zone around known great gray owl nest sites and provide a 300 foot no-harvest buffer around meadows and natural openings. Develop a standardized protocol for surveys within one year.

Applegate Adaptive Management Area

The following material summarizes Adaptive Management Area (AMA) direction which is an extract from the SEIS ROD.

Objectives

Develop and test new management approaches to integrate and achieve ecological and economic health and other social objectives.

Contribute substantially to the achievement of SEIS ROD objectives including provision of well-distributed late-successional habitat outside reserves, retention of key structural elements of late-successional forests on lands subjected to regeneration harvest, restoration and protection of riparian zones, and provision of a stable timber supply.

Specific emphasis for the Applegate AMA includes "development and testing of forest management practices including partial cutting, prescribed burning, and low impact approaches to forest harvest (e.g., aerial systems) that provide for a broad range of forest values, including late-successional forest and high quality riparian habitat.

Land Use Allocations

The Applegate AMA includes lands managed by BLM (150,752 acres) and the Forest Service (127,409 acres).

Management Actions/Direction

Develop a plan for the Applegate AMA. See Management Assessments and Plans toward the end of this chapter for additional information.

Seek innovative approaches to achieve technical and social objectives. Develop localized, idiosyncratic methods that will best reflect the needs of the land and communities. These approaches rely on the experience and ingenuity of resource managers and communities rather than traditionally derived and tightly prescriptive approaches that are generally applied in management of forests.

The AMAs are intended to be opportunities for learning. They provide a geographic focus for innovation and experimentation with the intent that such experience will be widely shared. Research and monitoring in the AMAs will further clarify standards and guidelines to meet intended objectives. Opportunities exist for education and technical training across agencies and communities.

Proceed with management activities in the adaptive management area while the plan is being developed. Initiation of activities will not be delayed by requirements for comprehensive plans or consensus documents beyond those needed to meet existing legal requirements for activities.

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Manage coarse woody debris, green trees and snags in a manner that meets the intent of the management actions/direction for the Matrix. There are no specific management actions/direction for these forest components in the AMA. More site-specific direction is anticipated to determine appropriate amounts of these components for southwestern Oregon.

Plan use of prescribed fire within Applegate AMA to meet specific habitat requirements. Retention of habitat components such as coarse woody debris and standing snags must be considered based on the natural role of fire.

Implement harvest objective and use of fire with intent of maintaining soil productivity and nutrient cycling capability.

- Minimize intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions. Prescribed fires should be planned to minimize the consumption of litter and coarse woody debris. However, fire will be utilized within the Applegate AMA based on the natural role of fire and the need to carefully reintroduce it.
- Minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.
- Reduce the intensity and frequency of site treatments.

Provide for old growth fragments in watersheds where little remains. The Matrix management actions/ direction for retaining late-successional forest in fifth field watersheds (see Matrix section for details) will be considered as a threshold for analysis in Adaptive Management Area planning rather than a strict management actions/direction. The role of remaining late-successional forest stands will be fully considered in watershed analysis before they can be modified.

During AMA planning, review relevant objectives, land use allocations, and management actions/ direction for resource programs established in this proposed resource management plan. They may be modified in AMA plans based on site-specific analyses. Otherwise, management actions/direction will be developed to meet the objectives of the AMA and the overall strategy. Development of management guidance will be coordinated with the Regional Ecosystem Office through the Regional Interagency Executive Committee.

Explore and support opportunities to research the role and effects of fire/fuels management on ecosystem functions.

Emphasize fire/fuels management cooperation across agency and ownership boundaries.

Follow the hazard reduction management actions/ direction in this proposed resource management plan (see Fire section) until the Adaptive Management Area plan is completed and approved.

Use accepted wildfire suppression strategies and tactics and conform to specific agency policy.

Develop research and monitoring objectives that are clear and measurable to gain information needed in forest ecological and social systems. Develop education framework that enhances agency and community capacity. Adaptive management is, by definition, information dependent.

Adaptive management areas are intended to provide flexible experimentation with policies and management. These areas should provide opportunities for land managing and regulatory agencies, other government entities, nongovernmental organization, local groups, landowners, communities, and citizens to work together to develop innovative management approaches. Broadly, AMAs are intended to be prototypes of how forest communities might be sustained.

Management Actions/Direction - Late-successional Reserves

A portion of the Munger Butte late-successional reserve (LSR) (32,937 acres) is located in the Applegate AMA.

Manage mapped and unmapped late-successional reserves in accordance with management actions/ direction stated previously. Management around these reserves will be designed to reduce the risk of catastrophic wildfire disturbances.

Site-specific standards and guidelines may be developed for the LSRs within the Applegate AMA based on research and monitoring objectives, consistent with LSR objectives and the adaptive management process (see Implementation E-13 specified in the SEIS ROD).

Management Actions/Direction - Riparian Reserves

Protect riparian reserves in a manner comparable to that prescribed for other federal land areas. Desired conditions may be achieved in a manner different than that prescribed for other areas, and research projects may be conducted within riparian zones. During analysis of riparian reserve widths, consider the contribution of these reserves to aquatic and terrestrial species. Through watershed analysis, take into account all species that were intended to benefit by the prescribed riparian reserve widths (i.e., fish, mollusks, amphibians, lichens, fungi, bryophytes, vascular plants, American marten, red tree voles, bats, marbled murrelets, and northern spotted owls).

More site-specific standards and guidelines will be developed for riparian reserves within the Applegate AMA based on watershed analysis, research, and monitoring objectives.

Congressionally Reserved Areas

Congressionally Reserved Areas are addressed in other sections of this alternative. The only areas that qualify is the Rogue Wild and Scenic River. The Pacific Crest National Scenic Trail is a congressionally designated area, but no specific reservations are included.

Managed Late-Successional Areas

Objectives

Protect populations of rare and locally endemic species where they occur outside designated reserves.

Land Use Allocation

Managed late-successional reserves will be established within Matrix lands where Del Norte and Siskiyou Mountain salamanders are found. In addition, should the four species of fungus and moss identified in the SEIS ROD (page C-27) be located within the planning area they also will receive managed late-successional reserves.

Management Actions/Direction

Where sites are occupied by Siskiyou Mountain salamander or Del Norte salamander, protect the site from ground disturbing activities. Designate a buffer of at least the height of one site-potential tree of 100 feet horizontal distance, whichever is greater, surrounding the location. Within the site and the surrounding buffer, maintain at least 40 percent canopy closure and avoid any activities which would directly disrupt the talus layer. Develop and use standardized survey protocol to determine occupancy.

Locations where the four identified species of moss and fungi are found will be protected using the management standards and guidelines contained in the SEIS ROD (page C-27).

Administratively Withdrawn Areas

Administratively Withdrawn Areas (areas withdrawn from scheduled timber harvest) include such areas as timber production capability classification withdrawals, recreation sites, rights-of-way corridors, etc. Management of these areas are addressed in other sections of this alternative.

Matrix (General Forest Management Area and Connectivity/Diversity Blocks)

Objectives

Produce a sustainable supply of timber and other forest commodities.

Provide connectivity (along with other allocations such as riparian reserves) between late-successional reserves.

Provide habitat for a variety of organisms associated with both late-successional and younger forests.

Provide for important ecological functions such as dispersal of organisms, carryover of some species from one stand to the next, and maintenance of ecologically valuable structural components such as down logs, snags, and large trees.

Provide early-successional habitat.

Land Use Allocation

The matrix within the planning area has been divided into the northern and southern General Forest Managements Area and Connectivity/Diversity blocks. There are approximately 482,081 acres of BLM-administered land in the General Forest Management Area and 28,761 acres in Connectivity/ Diversity blocks. Connectivity/Diversity blocks vary in size and are distributed throughout the northern GFMA.

Management Actions/Direction

Management Actions/Direction - General Forest Management Areas

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Conduct timber harvest and other silvicultural activities in that portion of the Matrix with suitable forestlands, according to management actions/

direction summarized below and in the Timber section.

Provide a renewable supply of large down logs well distributed across the Matrix lands in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand.

- Leave a minimum of 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Where this management actions/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.

- In areas of partial harvest, apply the same basic management actions/direction, but they can be modified to reflect the timing of stand development cycles.

- Retain coarse woody debris already on the ground and protect it to the greatest extent possible from disturbance during treatment (e.g., slash burning and yarding).

Provide a renewable supply of large live trees and snags well distributed across the Matrix lands in a manner that provides habitat for cavity using birds, bats, and other species; provides structure and habitat diversity; provides future sources of large down logs; and provides for other ecological functions. Retained live trees and snags will reflect the species mix of the original stand. Emphasize retention of the largest trees and snags available to provide the unique structure and functions associated with these large old trees.

Retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) northern spotted owl activity centers.

Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management actions/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forestlands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.

- Within the General Forest Management Area north of Grants Pass (northern GFMA) retain at least 6 to 8 green conifer trees per acre in regeneration harvest units.

- Within the General Forest Management Area south of Grants Pass (southern GFMA) retain at least 16 to 25 green conifer trees per acre in regeneration harvest units.

Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to:

- Minimize intensive burning unless appropriate for certain specific habitats, communities, or stand conditions. Prescribed fires should be planned to minimize the consumption of litter and coarse woody debris.

- Minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.

- Reduce the intensity and frequency of site treatments.

Where sites are occupied by Siskiyou Mountain Salamander or Del Norte Salamander, protect the site from ground disturbing activities. Designate a buffer of at least the height of one site-potential tree or 100 feet horizontal distance, whichever is greater, surrounding the location. Within the site and the surrounding buffer, maintain at least 40 percent canopy closure and avoid any activities which would directly disrupt the talus layer. Develop and use standardized survey protocol to determine occupancy. These sites are referred to as managed late-successional reserves in the SEIS ROD.

Conduct surveys for roosting bats. As an interim measure, prohibit timber harvest within 250 feet of sites containing bats. Develop management standards and guidelines for each site.

Retain snags and green trees within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per-acre requirements met on average areas no larger than 40 acres.

Within the matrix, provide snags and future sources of snags to maintain 100 percent of the potential population levels of white-headed and black-backed woodpeckers. Within the range of these species, this level of snag retention will be added to the normal standards and guidelines for snag retention levels in the Matrix. It is assumed these snag levels provide adequate habitat for pygmy nuthatches and flammulated owls.

In addition to the previous green-tree retention management actions/direction, retain green trees for snag recruitment in timber harvest units where there is an identified, near-term (less than three decades) snag deficit. These trees do not count toward the green-tree retention requirements.

Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species, survey for Allotropa virgata, Bensoniella oregana, Cypripedium fasciculatum and Cypripedium montanum. Survey for Del Norte salamanders, Siskiyou Mountain salamanders, and red tree voles. These surveys will precede the design of all ground-disturbing activities to be implemented in 1997 or later.

Protect known occupied locations of Ptilidium californicum (Liverwort) by deferring timber harvest and avoiding removal of fallen trees and logs. The district has one known site at this time. If Ulota meglospora (Moss), Aleuria rhenana (Fungus), Otidea leoporina, Otidea onotica and Otidea smithii (Fungi) are discovered defer ground-disturbing activities.

Additional trees may need to be retained to contribute to bat roost sites on a site-specific basis.

Retain some large hardwood trees, where present in harvest units, to provide habitat diversity.

Management Actions/Direction - Connectivity/ Diversity (C/D) Blocks spaced throughout the Matrix lands in the northern GFMA

Maintain at least 25 to 30 percent of each block in late-successional forest. Riparian reserves and other allocations with late-successional forest count toward this percentage. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block will provide effective habitat to the extent possible.

Retain at least 12 to 18 green conifer trees per acre in regeneration harvest units.

Resource Programs

The following section includes objectives, land use allocations, and management actions/direction for the resource uses and programs BLM manages in the Medford District. Some of the management actions/ direction in the previous land use allocation section are repeated in this section. The intent of this duplication is to give a reader a package of related management guidance in one location.

Air Quality

Objectives

Continue efforts to meet National Ambient Air Quality Standards, Prevention of Significant Deterioration, and the Oregon Visibility Protection Plan and Smoke Management Plan goals.

Maintain and enhance air quality and visibility in a manner consistent with the Clean Air Act and the State Implementation Plan.

Use prescribed fire to reduce the potential for wildfire emissions through the use of prescribed fire and other fuels management techniques.

Consider alternative emission reduction techniques whenever they are compatible with land allocation objectives and other management actions/direction. See the Air Quality Analysis section of the FSEIS for alternative treatments that may be considered during fuels management project design.

Land Use Allocations

None.

Management Actions/Direction

By the year 2000, reduce particulate matter emissions and impacts from prescribed burning by 50 percent from the baseline period (1976-1979). This will be accomplished by planning, conducting, monitoring, and if necessary, adjusting prescribed fire activities in accordance with the Oregon State Implementation Plan and the Oregon Smoke Management Plan (see Fire section).

Minimize broadcast burning in favor of lower intensity underburning. Use emission reduction mitigation measures and smoke dispersal techniques to the greatest extent practical.

Wildfire hazard reduction, site preparation, and the use of prescribed fire for species habitat mitigation will be implemented in a manner consistent with ecosystem management objectives.

Where appropriate, use dust abatement measures during construction activities and on roads during BLM wood product removal or other BLM commodity hauling activity. Encourage dust abatement measures when haulers use BLM roads under permits and right-of-way agreements.

Prepare conformity determinations required by the Clean Air Act as part of implementing planning.

Perform an emissions tradeoff analysis to determine and quantify the effects of prescribed burning and other types of fuel management on reduction of wildfire emissions. This analysis should be performed at the same geographic scale as conformity determinations.

For designated nonattainment areas where smoke from woodstoves has shown to be a major source of particulate matter directly effecting both health and visibility, mitigation can include the following:

- close permitted firewood cutting use on or before September 30 of each year to assure that firewood is not collected when it is wet, and some curing time is available prior to burning;
- coordinate the issuance of educational information with wood cutting permits that target proper gathering practices and ways to minimize adverse effects on air quality from inefficient burning wood; and
- cooperate with local air quality control agencies and other federal land management agencies to assure uniform and accurate dissemination of public information and educational material on proper firewood use and enforcement of permit requirements across agency boundaries.

See Special Forest Product's section for additional information on firewood availability.

Water and Soil

Objectives

See Aquatic Conservation Strategy objectives.

As directed by the Clean Water Act, comply with state water quality requirements to restore and maintain water quality necessary to protect designated beneficial uses for the Rogue, Umpqua, and Klamath basins.

Improve and/or maintain soil productivity.

Land Use Allocations

None specifically for water quality or soils. However, riparian reserves, key watershed provisions, and timber production capability classifications will assist in meeting water quality and soils management objectives.

Nonsuitable woodlands, which include all landslide prone areas and other unstable soils, are identified as not suitable for timber harvest. Surface-disturbing activities other than timber harvest will be prohibited unless adequately mitigated to maintain site productivity and protect water quality.

Management Actions/Direction

Management Actions/Direction - Late-Successional Reserves

Consider watershed restoration projects if they provide late-successional habitat benefits or if their effect on late-successional associated species is neutral or beneficial. Design and implement watershed restoration projects in a manner that is consistent with late-successional reserve objectives.

Management Actions/Direction - General

Improve and/or maintain soil and water conditions by closing selected areas to off-highway vehicle use and/or limiting such use to existing or designated roads and trails. See Recreation and Off-highway Vehicles for additional details.

Management Actions/Direction - Water

See Management Actions/Direction for Riparian Reserves, Key Watersheds, and Watershed Restoration (located in Aquatic Conservation Strategy section).

Continue to implement a nonpoint source management program in cooperation with the U. S. Environmental Protection Agency and the Oregon Department of Environmental Quality.

Ensure consistency of management activities with Oregon's Statewide Water Quality Management Plan for forest practices and with Oregon's water quality criteria and guidelines (Oregon Administrative Rule 340-41). This includes consistency with Oregon's program for water quality limited streams in the planning area, which are Bear Creek and its tributaries, Little Butte Creek, and Evans Creek.

Continue coordination with the Oregon Department of Environmental Quality for implementation of best management practices which protect beneficial uses of water (see Best Management Practices, Appendix F).

Protect floodplains and wetlands in accordance with Executive Orders 11988 and 11990 and BLM's Riparian-Wetlands Initiative for the 1990s (USDI, BLM 1991a).

Cooperate with federal, state, local, and tribal agencies and private landowners to develop watershed-based coordinated resource management plans or other cooperative agreements to meet aquatic conservation strategy and riparian reserve objectives.

Prepare watershed plans in conjunction with and for the following community water systems where BLM administers a significant portion of land within the watershed:

city of Butte Falls,
city of Glendale (section of Mill Creek),
city of Talent (Wagner Creek), and
city of Yreka.

Use watershed analysis to identify water quality concerns, watershed restoration opportunities, and water monitoring strategies.

Design and implement watershed restoration projects that promote long-term ecological integrity of ecosystems, conserve the genetic integrity of native species, and attain aquatic conservation strategy and riparian reserve objectives (see Aquatic Conservation Strategy and Riparian Reserve sections for additional guidance).

Manage uplands to minimize nonpoint source pollution and moderate extremes in streamflow by maintaining or improving hydrologic functions (e.g., infiltration, instream flow, groundwater quantity, etc.).

Prevent watershed degradation rather than using mitigation or planned restoration to correct foreseeable problems caused by management activities (see Best Management Practices, Appendix F for additional guidance).

Defer the following areas (approximately 49,636 acres) identified as having high watershed cumulative effects from management activities, including timber harvest and other surface-disturbing activities for ten years, starting from January 1993. See Appendix U for analysis identifying cumulative effects for these areas. Management activities of a limited nature (e.g., riparian, fish or wildlife enhancement, salvage, etc.) could be permitted in these areas if the effects will not increase the cumulative effects. Watershed management plans will be prepared if rehabilitation is deemed appropriate. The following areas will be reevaluated during the next planning cycle or by January 2003 (see Watershed Deferrals next page).

Designate four areas covering approximately 4,000 acres as watershed monitoring areas and defer them from timber harvest and other management activities over the planning period. Tentative watershed selections are East Fork Bobby Creek, Upper Star Gulch, Upper Morine Creek, and Pipe Fork. These watersheds, when paired with like watersheds where management activities will occur, will provide baseline information of the effects of management activities on water quality and quantity.

Identify instream flows needed to maintain riparian resources, channel conditions, aquatic habitat, and water quality. Attempt to acquire or encourage the State of Oregon to acquire instream flow water rights.

Apply for water rights to support the needs for fire suppression, construction/maintenance (e.g., pump chances, water holes, and reservoirs), grazing, recreation and other programs.

Locate water drafting sites to minimize adverse effects on stream channel stability, sedimentation, and in-stream flows needed to maintain riparian resources, channel conditions, and fish habitat.

If herbicides, insecticides, and other chemicals are applied, do so in a manner that avoids impacts that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.

Use land acquisition, exchange, and conservation easements to meet aquatic conservation strategy and riparian reserve objectives.

Management Actions/Direction - Soil

Apply best management practices during all ground- and vegetation-disturbing activities. See Appendix F for a list of practices.

Utilize silvicultural systems that are capable of maintaining or improving long-term soil productivity.

Watershed Deferrals

Analytical Watershed	Subwatershed	Area Deferred	BLM Acres
Big Butte Creek	Clark Creek	Clark Creek	2,075
Deer Creek	White Creek	White Creek	1,593
Elk Creek	Middle Elk Creek	Alco-Middle	1,271
		Flat Creek	4,099
		Miller-Jones	759
		Yellow Rock	1,482
Evans Creek	East Fork Evans Creek	Sprignet Creek	1,454
	Upper W. Fork Evans Creek	West Fork Evans Headwaters	1,311
		West Skeleton Mountain	1,023
		Ash Flat	1,498
	Rock/Salt Creeks	Cold Creek	1,423
Grave Creek	Upper Grave Creek	Upper Grave Creek	1,880
		Grave-Boulders	1,044
Jenny Creek	Keene Creek	Parsnip-Keene	1,083
Jumpoff Joe Creek	Upper Jumpoff Joe Creek	Upstream of Water Branch Creek	3,397
	Louse Creek	Upper Louse Creek	4,014
Little Butte Creek	Lake Creek	Upper Lake Creek	984
Rogue-Lost Creek	Upper Lost Creek	Vine Maple	2,375
	Lower Lost Creek	Lost-Floras	1,866
Rogue-Wild Section	Missouri Creek	Missouri-Trout	3,684
Silver Creek	North Fork Silver Creek	North Fork Silver Creek	8,284
Williams Creek	West Fork Williams Creek	Lone-Goodwin	3,037

Design logging systems to avoid or minimize adverse impacts to soils.

Provide a renewable supply of large down logs well distributed across the Matrix lands in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand.

- Leave a minimum of 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Where this management actions/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.
- In areas of partial harvest, apply the same basic management actions/direction, but they can be modified to reflect the timing of stand development cycles.
- Retain coarse woody debris already on the ground and protect it to the greatest extent possible from disturbance during treatment (e.g., slash burning and yarding).
- Use watershed analysis to determine appropriate amounts of coarse woody debris for site-specific conditions.

Manage lands dominated by fragile granitic and schist soils consistent with southern general forest management area guidelines. In addition, limit surface-disturbing activities on all lands dominated by fragile granitic, schist, and pyroclastic soils (approximately 85,300 acres) to maintain site productivity, reduce soil erosion, and minimize water quality degradation. These soils are scattered throughout the planning area, however, the largest concentrations of soils formed from decomposed schist and/or granite parent material occur in Evans, Snow, Sugar, and Meadow Creeks, upper portions of Williams Creek, and headwaters of Birdseye Creek.

Soils formed in deeply weathered pyroclastic parent materials are predominantly in the foothills of the Cascades. (See Appendix F for fragile soils mitigation measures.)

While the goal of maintaining long-term soil productivity is inherent in all management practices, it is recognized that some minor losses in productivity could result due to surface disturbances (soil compaction, road construction, etc.) caused by management activities. Implementing best management practices and minimizing disturbance of fragile areas will keep losses to a minimum (see Appendix F).

Special Status and SEIS Special Attention Species Habitat

Objectives

See late-successional reserve, riparian reserve, Matrix and Special Area objectives.

Protect and conserve federal listed and proposed species, and manage their habitats to achieve their recovery in compliance with the Endangered Species Act, approved recovery plans, and Bureau special status species policies.

Manage for the conservation of federal candidate and Bureau-sensitive species and their habitats so as not to contribute to the need to list and to recover the species.

Manage for the conservation of state listed species and their habitats to assist the state in achieving management objectives.

Protect and manage assessment species where possible so as to not elevate their status to any higher level of concern.

Protect SEIS special attention species so as not to elevate their status to any higher level of concern.

Maintain or restore community structure, species composition, and ecological processes of special status plant and animal habitat.

Land Use Allocations

All of the major land allocations in this plan are designed in part to benefit special status species across the District. Specific land use allocations are generally too small to be mapped at the scale used for the RMP.

Management Actions/Direction

Management Actions/Direction - Late-Successional Reserves

Consider projects required for recovery of threatened or endangered animal and plant species even if they result in some reduction of habitat quality for late-successional species. These projects will be designed for least impact to late-successional species.

Management Actions/Direction - All Land Use Allocations - Special Status Species

Review all proposed actions to determine whether or not special status species occupy or use the effected area or if habitat for such species could be affected.

Conduct field surveys according to current protocol. This includes surveying during the proper season. Field surveys may not be conducted in all cases depending on the number and timing of previous surveys conducted, whether previous surveys looked for all species that a new survey would, and the likelihood of potential habitat. The intensity of field surveys will also vary depending on the same factors.

Consult with or request technical assistance from the U.S. Fish and Wildlife Service (USFWS) or National Marine Fisheries Service (NMFS) for any proposed action that may effect federal listed, proposed, or candidate species or their critical or essential habitat. Based on the results of consultation, modify, relocate, or abandon the proposed action.

Coordinate with the USFWS, NMFS, and other appropriate agencies and organizations and jointly endeavor to recover federal listed and proposed plant and animal species and their habitats.

Modify, relocate, or abandon proposed actions to avoid contributing to the need to list federal candidate species, State listed species, Bureau-sensitive species, or their habitats.

Coordinate with the State of Oregon to conserve state listed species.

Identify impacts of proposed actions, if any, to Bureau-sensitive and assessment species and clearly describe impacts in environmental analyses. As funding permits and as species conservation dictates, assessment species will be actively managed.

Retain under federal management (or other appropriate management organizations), habitat essential for the survival or recovery of listed and proposed species. Retain habitat of proposed, candidate, or Bureau-sensitive species where disposal could contribute to the need to list the species.

Where appropriate opportunities exist, acquire land to contribute to recovery, reduce the need to list, or enhance special status species habitat.

Coordinate with other agencies and groups in management of species across landscapes. Coordination will be accomplished through conservation plans or similar agreements that identify actions to conserve single or multiple species and/or habitats. Such strategies could preclude the need for intensive inventories or modifications to some projects where the conservation plan provides adequate protection for the species and meets the intent of policy.

Where plans exist for species no longer on the special status list, continue with the prescribed conservation actions if determined to be required to avoid relisting or future consideration for listing. In the case of interagency plans or agreements, this determination will be mutually decided. Such plans may be modified as needed, based on adequacy of existing range-wide conditions and conservation management.

Pursue opportunities for public education about conservation of species.

Where appropriate, pursue opportunities to increase the number of populations of species under BLM management through land acquisition and/or species reintroduction.

Integrate management of special status plants into watershed assessment, looking at historic patterns and modeling to improve habitat for special status plants.

Implement prescribed burns to enhance habitat for special status plants.

Implement noxious weed control in habitat of special status plants.

Develop and implement automated data bases for storage and retrieval of information on special status plants.

Design and schedule site-specific management prescriptions and projects to benefit individual species habitats in allotment management plans and recreational management plans.

Develop monitoring plans for special status plants and their habitats that schedule measurement and periodic evaluation of trend, status,and progress toward meeting recovery and conservation objectives.

Develop monitoring plans to determine viability of populations over time and effects of management actions.

Develop Conservation Agreements with USFWS on federal candidate plants to act as recovery plans and prevent listing.

Develop and implement education and outreach plans to improve public understanding and awareness of the need to protect and manage special status plants. Develop botanical (Wildflower) viewing sites for the public as part of the Watchable Wildlife Program.

Collect seed from special status plant species for storage at Berry Botanic Garden Cryogenic Seed Bank.

Implement Rare and Natural Plant Communities, for Fish and Wildlife Program 2000.

Identify and manage special habitat areas such as wetlands, serpentine areas, wet and dry meadows, and rock cliffs where over 50 percent of the special status plants occur.

Where sites are occupied by Siskiyou Mountain Salamander or Del Norte Salamander, protect the site from ground-disturbing activities. Designate a buffer of at least the height of one site-potential tree or 100 feet horizontal distance, whichever is greater, surrounding the location. Within the site and the surrounding buffer, maintain at least 40 percent canopy closure and avoid any activities that would directly disrupt the talus layer. Develop and use standardized survey protocol to determine occupancy. These sites are referred to as managed late-successional reserves in the FSEIS ROD.

Conduct surveys for roosting bats. As an interim measure, prohibit timber harvest within 250 feet of sites containing bats. Develop management standards and guidelines for each site.

Management Actions/Direction - All Land Use Allocations - SEIS Special Attention Species

Appendix G identifies species included under the following groupings: survey and manage and protection buffer species (both from the ROD on the SEIS), and special status species specific to the district.

Management Actions/Direction - Survey and Manage Strategies

Implement the survey and manage provisions of the SEIS ROD. Appendix G shows which species are covered by this provision, and which of the following four categories and management actions/direction are to be applied to each:

Survey Strategy 1: Manage known sites (highest priority).

- Acquire information on these sites, make it available to all project planners, and use it to design or modify activities.
- Protect known sites. For some species, apply specific management treatments such as prescribed fire.
- For rare and endemic fungus species, temporarily withdraw 160 acres around known sites from ground-disturbing activities until the sites can be thoroughly surveyed and site-specific measures prescribed.

Survey Strategy 2: Survey prior to ground disturbing activities and manage sites.

- Continue existing efforts to survey and manage rare and sensitive species habitat.
- For species without survey protocols, start immediately to design protocols and implement surveys.
- Within the known or suspected ranges and within the habitat types of vegetation communities associated with the species, survey for Allotropa virgata, Bensoniella oregana, Cypripedium fasciculatum and Cypripedium montanum. Survey for Del Norte salamanders, Siskiyou Mountain salamanders, and red tree voles. These surveys will precede the design of all ground-disturbing activities to be implemented in 1997 or later.
- For the other species listed in Appendix G, begin development of survey protocols in 1994 and proceed with surveys as soon as possible. These surveys will be completed prior to ground-disturbing activities that will be implemented in Fiscal Year 1999 or later. Work to establish habitat requirements and survey protocols may be prioritized relative to the estimated threats to the species as reflected in the SEIS.
- Conduct surveys at a scale most appropriate to the species.
- Develop management actions/direction to manage habitat for the species on sites where they are located.
- Incorporate survey protocols and proposed site management in interagency conservation strategies developed as part of ongoing planning efforts coordinated by the Regional Ecosystem Office.

Survey Strategy 3: Conduct extensive surveys and manage sites.

- Conduct extensive surveys for the species to find high-priority sites for species management. Specific surveys prior to ground-disturbing activities are not a requirement.
- Conduct surveys according to a schedule that is most efficient and identify sites for protection at that time.
- Design these surveys for efficiency and develop standardized protocols.
- Begin these surveys by 1996.

Survey Strategy 4: Conduct general regional surveys.

- Conduct general regional surveys to acquire additional information and to determine necessary levels of protection for arthropods, fungi species that were not classed as rare and endemic, bryophytes, and lichens.
- Initiate these surveys no later than Fiscal Year 1996 and complete them within 10 years.

Management Actions/Direction - Protection Buffer Species

Provide protection buffers for specific rare and locally endemic species (see Appendix G). These species are likely to be assured viability if they occur within reserves. However, there might be occupied locations outside reserves that will be important to protect as well.

Apply the following management actions/direction:

- Develop survey protocols that will ensure a high likelihood of locating sites occupied by these species.
- Following development of survey protocols and prior to ground-disturbing activities, conduct surveys within the known or suspected ranges of the species and within the habitat types or vegetation communities occupied by the species. See the previous Survey and Manage section for an implementation schedule.
- When located, protect the occupied sites as follows:

Nonvascular Plants

***Ptilidium californicum* (Liverwort):**

- Management direction includes finding locations and maintaining stands of overmature white fir at about 5,000-feet elevation for inoculum and dispersal along corridors, and studying specific distribution patterns.
- Protect known occupied locations if distribution patterns are disjunct and highly localized by deferring timber harvest and avoiding removal of fallen trees and logs.

***Ulota meglospora* (Moss):**

- Management direction includes conducting basic ecological studies and surveying for presence.
- Protect known occupied sites if distribution patterns are disjuncnt and highly localized.
- Defer timber harvest or other activities that would not maintain desired habitat characteristics and population levels.

Brotherella roellii (Moss):

- Management direction includes locating specific populations and protection of large decay class 3, 4, and 5 logs and maintaining canopy closure greater than 70 percent.
- Defer management activities that conflict with maintaining suitable habitat characteristics and known populations levels.

***Buxbaumia piperi, B. viridis, Rhizomnium nudum, Schistostega pennata,* and *Tetraphis geniculata* (Mosses):**

- Management direction includes surveying to determine presence and distribution; and where located, maintaining decay class 3, 4, and 5 logs and greater than 70 percent closed-canopy forest habitats for shade.

***Aleuria rhenana* (Fungus):**

- Management direction includes conducting ecological studies and surveys to determine localities.
- Protect known populations if surveys continue to indicate that the population is rare.
- Defer ground-disturbing activities.

***Otidea leporina, O. onotica,* and *O. smithii* (Fungi):**

- maintain a spatially explicit data base of all known sites in planning area.
- develop species or area management plans to be implemented under the guidance of the regional botany programs.

***Polyozellus multiplex* (Fungus):**

- Management direction for this species includes conducting surveys to define its distribution and studies to assess its habitat requirements.

***Sarcosoma mexicana* (Fungus):**

- Management direction for this species includes conducting surveys to define its distribution and studies to assess its habitat requirements.

Management Actions/Direction - All Land Use Allocations - Listed and Proposed Threatened and Endangered Species

Management Actions/Direction - General

Implement the land use allocations and management actions/direction of this proposed resource management plan which are designed to enhance and maintain habitat for threatened and endangered species.

Management Actions/Direction - Northern Spotted Owl (federal threatened species)

In the Matrix, retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) northern spotted owl activity centers.

With minor exceptions, restrict human activities that could disturb owl nesting, especially timber falling and yarding and the use of large power equipment, within one-quarter mile of all active northern spotted owl nest sites from approximately March 1 to September 30.

Management Actions/Direction - Marbled Murrelet (federal threatened species)

Conduct two years of survey prior to any human disturbance of marbled murrelet habitat within 50 miles of the coast.

Protect contiguous existing and recruitment habitat for marbled murrelets (i.e., stands that are capable of becoming marbled murrelet habitat within 25 years) within a 0.5 mile radius of any site where the birds' behavior indicates occupation (e.g., active nest, fecal ring or eggshell fragments, and birds flying below, through, into, or out of the forest canopy within or adjacent to a stand).

During silvicultural treatments of nonhabitat within the 0.5 mile radius around occupied stands, protect or enhance suitable or replacement habitat.

Neither conduct nor allow harvest of timber within occupied marbled murrelet habitat at least until completion of the Marbled Murrelet Recovery Plan.

Amend or revise management direction as appropriate when the Recovery Plan is completed.

Restrict human activities that could disturb marbled murrelet nesting.

Management Actions/Direction - Bald Eagle (Federal Threatened Species)

Comply with the Pacific Bald Eagle Recovery and Implementation Plan and existing, site-specific habitat management plans.

Within one-half mile of active bald eagle sites, do not allow aerial use of herbicides or pesticides and minimize human disturbance between February 1 and August 15. Retain requisite forest habitat characteristics including large trees, snags, and at least 50 percent canopy closure. Prepare a site-specific management plan to provide more specific management guidelines for bald eagles.

Protect the core area around known bald eagle nest sites. In addition to the measures used in the one-half mile radius within the protected core area, allow no planned timber harvest except to benefit bald eagle nest habitat, no new road construction, and no surface occupancy (NSO) for leasable minerals.

Retain two additional 80-acre areas with suitable nesting characteristics for future territory establishment consistent with the Pacific Bald Eagle Recovery Plan. One of these would be located along the wild section of the Rogue River in the vicinity of Whiskey Creek and the other would be in the Finley Bend area along the recreational section of the Rogue River. In addition, manage one block of at least 80 acres for nesting habitat within one-half mile of each of the following water bodies to provide for future population expansion: Galesville Reservoir, Illinois River, Emigrant Lake, Hyatt Lake, Howard Prairie and Lost Creek reservoirs.

Management Actions/Direction - Peregrine Falcon (Federal Endangered Species)

Comply with the Peregrine Falcon Recovery Plan and existing, site-specific habitat management plans.

Minimize human disturbance with the potential to disturb nesting falcons within one mile of active peregrine falcon nest sites between January 1 and July 15. Prepare a site-specific management plan for each active site.

The core area within one-half mile of active peregrine nest sites would receive additional protection. In addition to the measures used in the one-mile radius within the protected core area, there would be no scheduled timber harvest, no aerial application of herbicides or pesticides, and no surface occupancy (NSO) for leasable minerals. There will be no new road construction unless the activity would not adversely effect the integrity of the site.

Wildlife Habitat

Objectives

See Late-Successional Reserve, AMA, Riparian Reserve, and Matrix objectives.

Enhance and maintain biological diversity and ecosystem health to contribute to healthy wildlife populations.

Land Use Allocations

The land use allocations in this proposed resource management plan are designed to benefit wildlife species, that use the various seral stages and other habitat areas of the forest. Various land use allocations are made for a variety of species.

Management Actions/Direction

Management Actions/Direction - All Land Use Allocations

Use the watershed analysis process to address wildlife habitat issues for individual watersheds. The analysis will help to resolve any concerns identified in applying management actions/direction in this section and those in the Special Status and SEIS Special Attention Species section. Where appropriate, more site-specific habitat objectives and wildlife habitat enhancement opportunities will be identified through this process.

Coordinate with the Oregon Department of Fish and Wildlife during planning and implementation of wildlife habitat enhancement projects.

Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate impacts associated with habitat manipulation, poaching, and other activities that threaten the continued existence and distribution of native wildlife inhabiting federal lands.

Land will be acquired to facilitate wildlife habitat management, as appropriate.

Management Actions/Direction - Riparian Reserves

Design and implement wildlife habitat restoration and enhancement activities in a manner that contributes to attainment of aquatic conservation strategy and riparian reserve objectives.

Design, construct, and operate wildlife interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. For existing wildlife interpretative and other user-enhancement facilities inside riparian reserves, ensure that aquatic conservation strategy and riparian reserve objectives are met. Where aquatic conservation strategy and riparian reserve objectives cannot be met, relocate or close such facilities.

Cooperate with federal, tribal, and state wildlife management agencies to identify and eliminate wild ungulate impacts that are inconsistent with attainment of aquatic conservation strategy and riparian reserve objectives.

Management Actions/Direction - Late-Successional Reserves

Design projects to improve conditions for wildlife if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.

If introduction of a nonnative species is proposed, complete an assessment of impacts and avoid any introduction that would retard or prevent achievement of late-successional reserve objectives.

Evaluate impacts of nonnative species existing within late-successional reserves.

Develop plans and recommendations for eliminating or controlling nonnative species that are inconsistent with late-successional reserve objectives. Include an analysis of effects of implementing such programs on other species within late-successional reserves.

Establish a one-quarter mile protection zone around known great gray owl nest sites and provide a 300-foot no-harvest buffer around meadows and natural openings. Develop a standardized protocol for surveys within one year.

Management Actions/Direction - Matrix

Provide a renewable supply of large down logs well distributed across the Matrix lands in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand.

- Leave a minimum of 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Where this management actions/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.
- In areas of partial harvest, apply the same basic management actions/direction, but they can be modified to reflect the timing of stand development cycles.
- Retain coarse woody debris already on the ground and protect it to the greatest extent possible from

disturbance during treatment (e.g., slash burning and yarding).

Retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) northern spotted owl activity centers.

Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management actions/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forestlands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.

Provide a renewable supply of large live trees and snags well distributed across the Matrix lands in a manner that provides habitat for cavity using birds, bats, and other species; provides structure and habitat diversity; provides future sources of large down logs; and provides for other ecological functions. Retained live trees and snags will reflect the species mix of the original stand. Emphasize retention of the largest trees and snags available to provide the unique structure and functions associated with these large old trees.

- Within the General Forest Management Area north of Grants Pass (northern GFMA) retain at least 6 to 8 green conifer trees per acre in regeneration harvest units.
- Within the General Forest Management Area south of Grants Pass (southern GFMA) retain at least 16 to 25 green conifer trees per acre in regeneration harvest units.

Where sites are occupied by Siskiyou Mountain Salamander or Del Norte Salamander, protect the site from ground-disturbing activities. Designate a buffer of at least the height of one site-potential tree of 100 feet horizontal distance, whichever is greater, surrounding the location. Within the site and the surrounding buffer, maintain at least 40 percent canopy closure and avoid any activities which would directly disrupt the talus layer. Develop and use standardized survey protocol to determine occupancy. These sites are referred to as managed late-successional reserves in the SEIS ROD.

Conduct surveys for roosting bats. As an interim measure, prohibit timber harvest within 250 feet of sites containing bats. Develop management standards and guidelines for each site.

Within the matrix, provide snags and future sources of snags to maintain 100 percent of the potential population levels of white-headed and black-backed woodpeckers. Within the range of these species, this level of snag retention will be added to the normal standards and guidelines for snag retention levels in the Matrix. It is assumed these snag levels are adequate to provide adequate habitat for pygmy nuthatches and flammulated owls.

Retain snags and green trees within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per-acre requirements met on average areas no larger than 40 acres.

In addition to the previous green-tree retention management actions/direction, retain green trees for snag recruitment in timber harvest units where there is an identified, near-term (less than three decades) snag deficit. These trees do not count toward the green-tree retention requirements.

Additional trees may need to be retained to contribute to bat roost sites on a site-specific basis.

Retain some large hardwood trees, where present in harvest units, to provide habitat diversity.

Management Actions/Direction - Connectivity/ Diversity (C/D) Blocks spaced throughout the Matrix lands in the northern GFMA

Maintain at least 25 to 30 percent of each block in late-successional forest. Riparian reserves and other allocations with late-successional forest count toward this percentage. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block will provide effective habitat to the extent possible.

Retain at least 12 to 18 green conifer trees per acre in regeneration harvest units.

Management Actions/Direction - Raptors and Great Blue Heron

Protect nest sites, centers of activity, or rookeries as necessary to maintain the integrity of the site. Human disturbances that may disturb or interfere with nesting will be prohibited within one-quarter mile of active nesting areas between approximately March 1 and July 15.

Management Actions/Direction - Roosevelt Elk

Manage elk management areas (171,000 acres) to enhance elk habitat consistent with the objectives of other allocations (timber, old growth, connectivity):

- All roads except major collectors and arterials will be closed. New road construction will be minimized.
- Limit motorized vehicle use to an open road density of 1.5 miles per square mile, where possible.
- Impose seasonal restrictions on activities if needed to avoid disturbance and harassment.
- Maintain or enhance forage where appropriate by creating small openings in conifer stands of all ages, prescribed burning, seeding, fertilizing, underburning forest stands, or other means. In Matrix lands, priority would be given to utilizing portions of stands with little or no conifer stocking.
- Manage the mix of forage areas, thermal cover, hiding cover, and optimal cover to maintain or attain highly viable habitat condition for each of the four indices using the Wisdom Elk Model or equivalent model (see Appendix 2-WL-1, Draft RMP).

Management Actions/Direction - Deer and Elk Winter Range

Manage about 97,100 acres of deer and elk winter range in the Cascade foothills as winter range with an emphasis on providing thermal cover and minimizing disturbances.

- All roads, except major collectors and arterials, will be closed between November 15 and April 1. New road construction will be minimized.
- Maintain at least 20 percent of these areas in thermal cover, 70 percent canopy closure, canopy height of at least 40 feet, and large enough to avoid edge effects.
- Restrict activities to avoid disturbance between approximately November 15 and April 1.

Where elk management areas overlap with winter range areas, management directions for both areas will be applied.

Management Actions/Direction - Special Habitats

Protect special habitats for plants and animals, such as meadows, cliffs, caves, and talus slopes from disturbance as appropriate to the specific site. Generally, the buffer will vary from 100-200 feet but could be increased or decreased based on site-specific circumstances and the objective to protect the special habitat values. Protection and necessary mitigation will be determined during activity planning (see Table 2-17).

Use management practices, including fire, to obtain desired vegetation conditions in special habitats.

Management Actions/Direction - Oak Stands

White oak woodlands will be managed to maintain or enhance values for wildlife habitat, range, botanical values, and biological diversity. Utilize prescribed fire to maintain habitat conditions within the white oak woodland communities.

Management Actions/Direction - Golden Eagles

Protect approximately 30 acres around all golden eagle nest sites. Within those areas, allow no timber harvest or other habitat removal. Human disturbance will be prohibited between approximately March 1 and July 15. No new roads will be constructed within the 30-acre core area around active nests.

Fisheries Habitat

Objectives

See aquatic conservation strategy and riparian reserve objectives.

Maintain or enhance the fisheries potential of streams and other waters consistent with BLM's Fish and Wildlife 2000 Plan, the Bring Back the Natives initiative, and other nationwide initiatives.

Promote the rehabilitation and protection of fish stocks at risk and their habitat.

Maintain fish habitat to support viable fish populations as required by FLPMA.

Land Use Allocations

There are no land use allocations specific to fisheries. However, riparian reserves are managed in part, to provide sufficient fisheries habitat.

Management Actions/Direction

Management Actions/Direction - Riparian Reserves

Design and implement fish habitat restoration and enhancement activities in a manner that contributes to attainment of aquatic conservation strategy and riparian reserve objectives.

Design, construct, and operate fish interpretive and other user-enhancement facilities in a manner that does not retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. For existing fish interpretative and other user-enhancement facilities inside riparian reserves, ensure that aquatic conservation strategy and riparian reserve objectives are met. Where aquatic conservation strategy and riparian reserve objectives cannot be met, relocate or close such facilities.

Cooperate with federal, tribal, and state fish management agencies to identify and eliminate impacts associated with habitat manipulation, fish stocking, harvest and poaching that threaten the continued existence and distribution of native fish stocks inhabiting federal lands.

Management Actions/Direction - Late-Successional Reserves

Design projects to improve conditions for fish if they provide late-successional habitat benefits or if their effect on late-successional associated species is negligible.

Management Actions/Direction - All Land Use Allocations

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Use the watershed analysis process to address at-risk fish species and stocks and their habitat for individual watersheds. Where appropriate, fish habitat enhancement opportunities will be identified through this process.

Coordinate with the Oregon Department of Fish and Wildlife Wild Fish Policy during planning and implementation of fish habitat enhancement projects. Priority will be given to watersheds supporting at-risk fish species and stocks and those requiring extensive restoration.

As identified through watershed analysis, rehabilitate streams and other waters to enhance natural populations of anadromous and resident fish. Possible rehabilitation measures would include, but not be limited to, fish passage improvements, instream structures using boulders and log placement to create spawning and rearing habitat, placement of fine and coarse materials for over-wintering habitat, and riparian rehabilitation to establish or release existing coniferous trees. See Table 2-3 for a list of possible fish enhancement projects.

Except for land tenure Zone 3 lands, riparian and fish habitat will be retained unless land exchanges would improve management of fish, wildlife, or riparian habitat elsewhere.

BLM would work with the Oregon Department of Fish and Wildlife to determine appropriate streamflows for instream water rights to maintain or enhance aquatic habitat, particularly for special status species.

Best management practices (Appendix F), will be implemented for water quality and soil productivity whenever appropriate and practical to minimize adverse effects of management actions on water quality, fish, and riparian habitat.

BLM ownership in the watersheds shown on Table 2-18 would be blocked up where possible to improve watershed management for:

- Federal candidate fish and amphibian species (Jenny Creek sucker, Redband trout, and Western pond turtle);
- State of Oregon and American Fisheries Society sensitive fish species (coho salmon, winter and summer steelhead); and
- Prevent decline of other priority fish species in other watersheds.

Management direction in the PRMP for water and soils and riparian reserves also applies to Fisheries.

Special Areas

Objectives

Retain existing research natural areas and existing areas of critical environmental concern that continue to meet the criteria for designation. Retain other special areas. Provide new special areas where needed to maintain or protect important values.

Maintain, protect, or restore relevant and important value(s) of areas of critical environmental concern.

Preserve, protect, or restore native species composition and ecological processes of biological communities (including Oregon Natural Heritage Plan terrestrial and aquatic cells) in research natural areas. These areas will be available for short- or long-term scientific study, research, and education and will serve as a baseline against which human impacts on natural systems can be measured.

Provide for recreation uses and environmental education in outstanding natural areas. Manage uses to prevent loss of outstanding values.

Provide and maintain environmental education opportunities in environmental education areas. Control uses to minimize disturbance of educational values.

Land Use Allocations

Special Area Category	Number	Acres
Areas of Critical Environmental Concern[1]	16	7,236
Areas of Critical Environmental Concern/Research Natural Areas	13	10,274
Areas of Critical Environmental Concern/Outstanding Natural Areas	1	1,002
Environmental Education Areas	4	550
Illinois Valley Botanical Area	1	10,613
Cascade/Siskiyou Ecological Emphasis Area	1	16,340

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[1] This category includes only areas with an area of critical environmental concern designation. Double designated areas such as areas of critical environmental concern/research natural areas, are not included.

See Map 2-4 for locations and Table 2-12 for site-specific acres.

Management Actions/Direction

Manage previously designated special areas in accordance with approved management plans. If management plans have not been prepared for previously designated areas, manage in accordance with the guidelines in Table 2-12.

Develop site-specific management plans for new special areas as needed. Protect resource values in new areas pending completion of management plans (see Table 2-4 for management guidelines). Management plans will address such actions as land acquisition, use of prescribed fire, interpretation, introduced species, fire suppression, domestic grazing, insects and disease, public use, minerals, and hydrology.

Apply the guidelines of the prevailing land use allocation(s) to candidate areas of critical environmental concern that were dropped from further consideration. See Appendix H for a list of these areas and the land use allocations under which they would be managed.

Manage 10,613 acres in the Illinois Valley as a botanical emphasis area (BEA) due to the preponderance of special status plants. Actions including timber harvest will be allowed if they do not conflict with the habitat needs of these plants (see Map 2-4).

Manage 16,340 acres near Soda Mountain and Agate Flat areas as the Cascade/Siskiyou ecological emphasis area (see Map 2-4). Management will consider the four varied plant communities, two RNAs, two ACECs, special status plant and animal populations, crucial deer range for an interstate herd, and the outstanding recreation and scenic values. Off-highway vehicle use will be limited to designated roads. Timber harvest will be deferred for ten years pending completion of a management plan. Research and monitoring will be initiated to help develop management options to maintain the ecosystems of the area. Coordination will occur with the Redding Resource Area in California, on the Jenny Creek ACEC and the Horseshoe Range Wildlife area that are contiguous with this emphasis area. This area will be part of a quality management area (QMA) that includes the majority of the Dead Indian Plateau that is under BLM-administration. This is an area where greater emphasis will be placed on innovative social processes as a tool for achieving resource objectives through applied stewardship.

Designate 1,702 acres of the proposed Bobby Creek ACEC as Bobby Creek RNA to fill two high priority cells in the Oregon Natural Heritage Plan for the Klamath Mountains Province. These two cells are Douglas-fir-western hemlock/rhododendron-salal forest and Douglas-fir/rhododendron-salal forest.

Designate 495 acres of the proposed Flounce Rock ACEC as Flounce Rock Environmental Education area. Designate 10 acres of the proposed Flounce Rock ACEC as Baker Cypress ACEC.

Pursue mineral withdrawal in all RNAs.

Integrate special areas into landscape analysis.

Develop monitoring plans that address ecological status, defensibility and compliance monitoring issues.

Inventory and designate new RNAs as appropriate "cells" are identified.

Limit off-highway vehicle use in all special areas to existing roads (unless closed).

Forest Health

Objectives

Reduce tree mortality and restore the vigor, resiliency, and stability of forest stands that are necessary to meet land use allocations objectives.

Land Use Allocations

There are no specific land use allocations for forest condition restoration. There is the potential for restoration treatment in all allocations.

Management Actions/Direction

Management Actions/Direction - All Land Use Allocations

Design and implement silvicultural treatments in stands that are in a condition, or that will soon be in a condition, that prevents management objectives from being achieved. Treatments are intended to restore the ability of stands to respond to other management and to reduce the risk of mortality from insects, disease, and wildfire. Treatments will consist of thinning of stands, forest fertilization, reduction of understory vegetation, reduction of fuel ladders, and restoration of more stable plant communities.

Apply the management actions/directions in the Special Status and SEIS Special Attention Species section.

Design forest condition restoration treatments to be consistent with the long-term objectives of the allocation in which the treatment is proposed. Develop treatments in an interdisciplinary manner.

Design restoration treatments to maintain or improve soil productivity, meet coarse woody debris and snag objectives, maintain or improve hydrologic functions, and maintain the natural richness of tree species.

Develop forest condition restoration treatments at the stand level based on the combination of stand condition and trend, on the functional characteristics of the ecosystem, and on characteristics of the site.

Design treatments, as much as possible, to prevent the development of undesirable species composition, species dominance, or other stand characteristics. Design treatments to incorporate and restore ecosystem function. Employ the principles of integrated pest management and integrated vegetation management to avoid the need for direct treatments. Use herbicides only as a last resort.

OHV use will be limited to designated roads in areas which are infected with Port-Orford root disease.

Management Actions/Direction - Riparian Reserves

Design and implement forest condition restoration treatments in a manner that contributes to the attainment of aquatic conservation strategy and riparian reserve objectives.

Management Actions/Direction - Late-Successional Reserves

Design and implement forest condition restoration treatments that provide habitat benefits for late-successional associated species, or that have negligible effects on such species. Design treatments to be consistent with the LSR assessment.

When possible, avoid introducing nonnative plant species, including grasses, into late-successional reserves. If introduction of a nonnative species is proposed, complete an assessment of the impacts and avoid any introduction that would retard or prevent achievement of late-successional reserve objectives.

Evaluate the impacts of nonnative plant species existing within late-successional reserves. Develop plans and recommendations for eliminating or controlling nonnative plant species that are inconsistent with late-successional reserve objectives. Include an analysis of effects of implementing such programs on other species within the late-successional reserves.

Prior to the use of prescribed fire as a forest condition restoration treatment, develop an interdisciplinary fire management plan specifying how prescribed fire applications will meet the objectives of the late-successional reserve. Until the plan is approved, proposed activities will be subject to review by the Regional Ecosystem Office. Apply prescribed fire in a manner that retains the amount of coarse woody debris determined to be appropriate for the site based on watershed analysis.

Management Actions/Direction - Adaptive Management Areas

Emphasize cooperation across agency and ownership boundaries.

Management Actions/Direction - Connectivity/ Diversity Blocks

Maintain 25 to 30 percent of each block in late-successional forest at any point in time. The percentage of habitat will include habitat in other allocations, such as riparian reserves. The size and arrangement of habitat within a block should provide effective habitat to the extent possible.

Management Actions/Direction - General Forest Management Area (all)

Retain snags within forest condition restoration treatment units at levels sufficient to support species of cavity nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the matrix with per-acre requirements met on average areas no larger than 40 acres.

Management Actions/Direction - Special Habitats

In project areas containing special wildlife and plant habitats (e.g., talus and meadows), maintain ecologically significant buffers around the special habitat. This could be increased, decreased, or manipulated, based on site-specific circumstances. Ecologically significant buffers will be determined by interdisciplinary teams.

Recreation

Objectives

Provide a wide range of developed and dispersed recreation opportunities that contribute to meeting projected recreation demand within the planning area. Provision of recreation opportunities in or adjacent to water will be emphasized.

Manage scenic, natural, and cultural resources to enhance visitor recreation experience expectations and produce satisfied public land users.

Pursue recreation opportunities that will benefit local community economic strategies consistent with BLM land use objectives.

Manage off-highway vehicle (OHV) use on BLM-administered land to protect natural resources, provide visitor safety, and minimize conflicts among various users. Three areas will be managed specifically to provide for OHV use.

Enhance recreation opportunities provided by existing and proposed watchable wildlife and wildflower areas and national back country byways.

Manage special and extensive recreation management areas in a manner consistent with BLM's Recreation 2000 Implementation Plan and Oregon-Washington Public Lands Recreation initiative. Manage Special Recreation Management Areas to realize their potential to provide appropriate/ prescribed recreational experience opportunities while protecting sensitive resources, increasing public awareness, reducing conflicts and diversifying the regional economy. Manage Extensive Recreation Management Areas to provide opportunities for dispersed, unstructured, and resource-dependent recreation uses, while protecting sensitive resources.

Land Use Allocations

See Map 2-6 for locations and Table 2-4 for a list of sites and areas.

The congressionally-designated Pacific Crest National Scenic Trail and the Rogue National Wild and Scenic River will be managed to preserve their remarkably outstanding natural resource values and the desired recreational opportunity settings in accordance with applicable legislative mandates.

Special Recreation Management Areas. In addition to continuing management of the three existing special recreation management areas (SRMAs): Hyatt Lake-Howard Prairie Lake, Pacific Crest Trail National Scenic Trail, and Rogue National Wild and Scenic River. Two new SRMAs (Lost Creek and Galesville Reservoir) will be designated.

Recreation Sites and Trails. In addition to the 11 existing recreation sites that will continue to be managed and maintained, 29 potential recreation sites will be managed to maintain their potential for development. The 14 existing trails will continue to be maintained and 15 new potential trails will be developed. These potential sites and trails will be developed as funding and opportunity exists.

Back Country Byways. In addition to continuing management of three existing back country byways, eight new BCBWs will be designated. See Table 2-4 for comparison of developed sites, trails, SRMAs, and BCBWs that will be managed or maintained. (NOTE: Map 2-6 does not correctly illustrate the Williams to Selma Back Country Byway.)

Off-Highway Vehicles. Existing off-highway vehicle (OHV) closures within the congressionally-designated Rogue National Wild and Scenic River and the Pacific Crest National Trail, except for roads crossing the Pacific Crest Trail, will continue in order to protect their outstandingly remarkable recreational resource values and to meet legislative mandates.

All research natural areas (RNAs, 10,274 acres) will be closed to any OHV activity. Areas of critical environmental concern (ACECs, 7,236 acres), environmental education areas (EEAs, 550 acres), and recreational sites/campgrounds (1,000 acres) will be closed or limited to existing roads only depending on the values of the individual site. The Soda Mountain Wilderness Study Area (WSA 5,867) limits OHV use to existing ways/roads only. Big Game areas (268,000 acres) will be limited to existing roads not physically blocked or managed by a seasonal restriction.

About 49,636 acres will limit off-highway vehicle (OHV) use to existing roads. These acres are in deferred watersheds in the Ashland, Butte Falls, and Grants Pass resource areas. These watersheds have been identified as having high cumulative effects and management activities, including timber harvest and other surface disturbance, will be deferred for ten years. In certain instances, some watersheds will limit use to rocked or surfaced roads only. The northwest part of the district has been designated as limited and will limit off-highway vehicles to existing open roads unless specifically designated as closed. The remaining portion of the district will be considered open unless specifically limited or closed with a special designation.

The winter tubing hill (10 acres) and cross-country ski trails in the Ashland Resource Area will be closed to OHVs. Snowmobiles will be limited to existing roads when traveling through big game areas that are not seasonally closed. In other areas when a snow depth of 12 inches is reached, areas will be considered open and not limited to existing roads.

OHV use will be limited to designated roads in areas that have been infected with Port-Orford root disease

Three areas, Ferris Gulch (2,200 acres), Timber Mountain/John's Peak (16,250 acres), and Quartz Creek (7,120 acres) will be managed to provide for OHV use. See Table 2-15 for potential OHV designation by alternative.

Management Actions/Direction

Management Actions/Direction - General

Enhance travel and recreation management through increased emphasis on interpretive and informational signs and maps. Identify on informational handouts at field locations all major travel routes within the planning area. Prepare a districtwide travel map for public distribution. These actions, and others, will support state and local strategies to encourage tourism.

Manage recreation areas to minimize disturbance to a number of fungus and lichen species known to occur within these areas. Follow survey and manage actions/direction as stated in the introduction to Land Use Allocations and Resource Programs.

Management Actions/Direction - Riparian Reserves

Design new recreational facilities within riparian reserves, including trails and dispersed sites, so as not to prevent meeting aquatic conservation strategy and riparian reserve objectives. Construction of these facilities should not prevent future attainment of these objectives. For existing recreation facilities within riparian reserves, evaluate and mitigate impacts to ensure that these do not prevent, and to the extent practicable contribute to, attainment of aquatic conservation strategy and riparian reserve objectives.

Adjust dispersed and developed recreation practices that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. Where adjustment measures such as education, use limitations, traffic control devices, increased maintenance, relocation of facilities, and/or specific site closures are not effective, eliminate the practice or occupancy.

Management Actions/Direction - Late-Successional Reserves

Retain and maintain existing recreation developments consistent with other management actions/direction for late-successional reserves.

Use adjustment measures such as education, use limitations, traffic control devices, or increased maintenance, when dispersed or developed recreation practices retard or prevent attainment of late-successional reserve objectives.

Neither construct nor authorize new facilities that may adversely affect late-successional reserves.

Review on a case-by-case basis new recreation development proposals. They may be approved when adverse effects can be minimized and mitigated.

Locate new recreation developments to avoid degradation of habitat and adverse effects on identified late-successional species.

Remove hazard trees along trails and in developed recreation areas.

Management Actions/Direction - All Land Use Allocations

In addition to the guidelines for late-successional and riparian reserves, manage recreation resources consistent with the LUA, in which they occur, and consistent with the following guidelines.

Management Actions/Direction - Recreation Sites and Trails

Limit burn acreage within all developed sites and recreation trail areas. Use prescribed fire to reduce fire hazard and to protect developed sites from wildfire. Restrictions on fire suppression equipment use and activities should be identified on a site specific basis.

Manage timber within developed recreation sites for purposes of removing hazard trees, providing space for additional facilities and activity areas, and providing desired regeneration of the forest canopy.

Pursue mineral withdrawals for existing developed recreation sites and for proposed recreation sites when development is approved.

Management Actions/Direction - Special Recreation Management Areas

Address special recreation management area issues and prioritize projects in watershed analyses or separate recreation area management plans, as appropriate. Prepare project plans as needed.

Management Actions/Direction - Extensive Recreation Management Areas

Address extensive recreation management area issues and prioritize projects in watershed analyses. Prepare project plans as needed.

Management Actions/Direction - Back Country Byways

Coordinate management of back country byways with county governments, chambers of commerce, regional tourism alliances, and the U. S. Forest Service. Designation of backcountry byways does not change how adjacent lands are managed.

Wild and Scenic Rivers

Objectives

Manage designated segments of the National Wild and Scenic Rivers System to protect their outstandingly remarkable values and maintain and enhance the natural integrity of river-related values.

Find important and manageable river segments suitable for designation where such designation will contribute to the National Wild and Scenic Rivers System.

Protect outstandingly remarkable values identified on BLM-administered lands within the study corridors of eligible river segments studied and found suitable for inclusion as components of the National Wild and Scenic Rivers System.

Provide interim protective management for outstandingly remarkable values identified on BLM-administered lands along river segments determined eligible but not studied for inclusion as components of the National Wild and Scenic Rivers System.

Land Use Allocations

Designated River Segments

		BLM-Administered land	
River Segment	Classification	Miles	Acres
Rogue River (Josephine and Curry counties)	Wild	20	6,022
Rogue River (Josephine County)	Recreational	27	8,245

Four river segments that cover approximately 20 miles (all tributaries to the Rogue Wild and Scenic River) are found suitable for potential wild designation (see Map 2-3). No river segments are found suitable for potential scenic or recreation designation.

Suitable River Segments

River Segment	Classification	BLM-Administered land Miles	Acres
Big Windy Creek	Wild	6.82	111
East Fork Windy Creek	Wild	3.61	120
Dulog Creek	Wild	1.75	44
Howard Creek	Wild	7.02	240

The corridor width for rivers found eligible or studied for suitability is generally defined as one-quarter mile on either side of the river (approximately one-half mile wide corridor).

Suitability reports for river segments found suitable for inclusion in the national system are located in Appendix J.

Manage the natural integrity of river-related values to maintain or enhance the highest tentative classification. Classification criteria are found in Appendix 2-WS-1, Draft RMP.

Management Actions/Direction

Revise approved wild and scenic river management plans for both the wild and recreation segments of the Rogue River to address attainment of aquatic conservation strategy and riparian reserve objectives.

Manage the previously designated Rogue River, both the wild and recreation segments, according to existing management plans. A new management plan for the recreational segment is currently being prepared.

Under interim protective management, all authorized action on BLM-administered land within the one-half mile wide corridor must have either a positive or neutral effect on identified outstandingly remarkable values (ORVs) that resulted in rivers being found eligible/suitable (see Appendix 2-WS-2, Draft RMP). A synopsis of interim management follows:

Eligible and/or suitable recreational rivers: exclude timber harvest in the riparian reserves, moderately restrict development of leasable and salable minerals, and protect a segments' free-flowing values and identified ORVs.

Eligible and/or suitable scenic rivers: exclude timber harvest in the riparian reserve. Provide VRM Class II management in the one-half mile wide corridor, and protect a segments' free-flowing values and identified ORVs.

Eligible and/or suitable wild rivers: exclude timber harvest and other disturbing activities within the one-half mile wide corridor.

Determine the role of fire and probable risk of high intensity wildfire destroying scenic values within the wild section of the Rogue River. Determine the appropriate use of prescribed fire needed to meet long-term resource management objectives. Pending completion of the fire management activity plan, continue to maintain a higher level of protection through identification of extra protection needs on an annual basis.

Upon completion of the ROD for this proposed resource management plan, release from interim protection all river segments found not suitable for inclusion as components of the national system.

Visual Resources

Objectives

Manage all BLM-administered land to meet the following visual quality objectives:

- VRM Class I areas: preserve the existing character of landscapes.
- VRM Class II areas: retain the existing character of landscapes.
- VRM Class III areas: partially retain the existing character of landscapes.
- VRM Class IV areas: allow major modifications of existing character of landscapes.

Emphasize management of scenic resources in selected high-use areas to retain or preserve scenic quality.

Land Use Allocations

VRM Class	Acres
I	14,330
II	113,730
III	393,100
IV	337,370

VRM Class I: the Congressionally-designated Rogue Wild and Scenic River corridor.

VRM Class II:

- The seen area from the Rogue National Wild and Scenic River (wild section);

- The Hyatt/Howard Prairie Lake SRMA;
- The viewshed from Lost Creek Reservoir;
- Galesville SRMA;
- One-quarter mile on either side of the Pacific Crest Trail; and
- Within the foreground/middleground of Interstate 5 and Highway 62 from Shady Cove to Lost Creek Reservoir and the county road from Butte Falls to Prospect. (Foreground/middleground is defined as land within one mile or to the first ridge, whichever is closer.)

VRM Class III: BLM-administered land allocated to meet rural interface area (RIA) objectives unless lands within RIAs are already allocated to some other higher level of protection (e.g., W&SR, SRMAs, etc.).

VRM Class III or Class IV: the southern general forest management area (GFMA) as inventoried.

VRM Class IV: the northern GFMA (see PRMP map).

See Map 2-5 for the location of visual resource management classes.

Management Actions/Direction

Address visual resource management issues when conducting watershed analysis.

Use the visual resource contrast rating system during project level planning to determine whether or not proposed activities will meet VRM objectives. Use mitigation measures to reduce visual contrasts.

Provide for natural ecological changes in VRM Class I areas. Some very limited management activities may occur in these areas. The level of change to the characteristic landscape should be very low and must not attract attention. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Manage VRM Class II lands for low levels of change to the characteristic landscape. Management activities may be seen but should not attract the attention of the casual observer. Changes should repeat the basic elements of form, line, color, texture, and scale found in the predominant natural features of the characteristic landscape.

Manage VRM Class III lands for moderate levels of change to the characteristic landscape. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements of form, line color, texture, and scale found in the predominant natural features of the characteristic landscape.

Manage VRM Class IV lands for moderate levels of change to the characteristic landscape. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and should repeat the basic elements of form, line, color, and texture.

Cultural Resources (Including Native American Values)

Objectives

Protect cultural resource values including information and significant sites for public and/or scientific use by present and future generations.

Continue to fulfill responsibilities to appropriate Native American tribes as specified in existing laws and regulations.

Land Use Allocations

Sites with significant values will be protected from management actions and from vandalism to the extent possible. Cultural resource sites are not mapped in this plan or described in detail in this plan due to the sensitivity of resource values.

The Medford District manages three cultural resource sites on the National Register of Historic Places.

Management Actions/Direction

Conduct paleo-environmental, archaeological, anthropological, and historical studies.

Conduct systematic inventories of areas likely to contain cultural resources.

Evaluate archaeological and historical sites to determine their potential for contributing to public and scientific uses.

Support ecosystem-based management by providing information about past ecological conditions, past cultural/natural system interactions, and differences among cultural and social groups regarding ecosystem management values.

Develop project plans to preserve, protect, and enhance archaeological, historical and traditional use sites, and materials under the district's jurisdiction. This would include protection from wildfires.

Increase public awareness and appreciation of cultural resources through development of education and interpretive programs.

Develop methods and gather data to assess social and cultural ecosystem components of the environment for use in landscape-level analysis.

Monitor cultural resources and take appropriate law enforcement action related to unauthorized use.

Continue working with Native Americans to achieve the goals outlined in existing memoranda of understanding. Develop additional memoranda with Native American groups as needs arise.

Acquire significant cultural resource properties for public, cultural heritage, and scientific purposes.

Wilderness and Wilderness Study Areas

Objectives

Maintain the wilderness character of the Soda Mountain Wilderness Study Area (WSA) and the Brewer Spruce Instant Study Area (ISA) to comply with the Bureau's Wilderness Interim Management Policy.

Interim Land Use Allocations

Area Name	Wilderness Status	Acreage
Soda Mountain WSA	Study area	5,867
Brewer Spruce ISA	Instant study area	429

See Maps 2-3 and 2-4 for the location of these areas.

Management Actions/Direction

Follow interim management guidelines for wilderness study and instant study areas until decisions are made by Congress. Authorize no action that would diminish the suitability of these lands as wilderness. Take appropriate actions following congressional decision.

The President has transmitted his recommendations to Congress that Soda Mountain WSA (5,867 acres) be designated as wilderness and the Brewer Spruce ISA (429 acres) not be designated as wilderness.

If not designated wilderness, manage the west one-half of the Soda Mountain WSA (5,867 acres) as part of a late-successional reserve (LSR) and the east one-half as part of the Cascade/Siskiyou Special Emphasis Area. Objectives would be to maintain the ecological complexity and its pristine condition by maintaining the roadless condition and discouraging activities that would disrupt the unique diversity of the area, and maintaining the natural role of fire through the development of a fire management activity plan.

If not designated wilderness, enlarge the Brewer Spruce ISA from 429 acres to 1,240 acres and manage as an area of critical environmental concern/research natural area (ACEC/RNA).

Timber Resources

Objectives

Provide a sustainable supply of timber and other forest products.

Manage developing stands on available lands to promote tree survival and growth and to achieve a balance between wood volume production, quality of wood, and timber value at harvest.

Manage timber stands to reduce the risk of stand loss from fires, animals, insects, and diseases.

Provide for salvage harvest of timber killed or damaged by events such as wildfire, windstorms, insects, or disease, consistent with management objectives for other resources.

Land Use Allocations

Lands available for scheduled timber harvest are as follows:

Areas	Gross Acres	Net Acres
General Forest Management Areas (including visual resource management class II, rural interface, and TPCC restricted) (excluding RHAs and deferred watersheds)	448,778	147,093
Connectivity/Diversity Blocks	27,237	11,121
Adaptive Management Areas (excluding AMR)	113,914	32,781

Lands Available for Timber Harvest Only for Enhancement of Other Uses

Lands determined to be economically marginal are not included in the timber allocation. Timber harvest could occur from those lands when economic conditions made them economical and where consistent with land use allocations.

On lands unavailable for planned forest management such as woodlands, recreation sites, late-successional reserves, protection buffers, riparian reserves, ACECs, wild river corridors, habitat for threatened and endangered, and special status species including the northern spotted owl, TPCC withdrawn lands, etc., timber harvest will occur only as part of strategies to enhance other resources such as riparian habitat, wildlife habitat, or management of special areas. (Harvest from these lands, if they occur, are not included in the PSQ.)

The following lists some of the reasons that timber harvest could occur on these lands.

- To reduce road construction, thereby reducing overall cumulative effects.
- Salvage timber killed or substantially damaged by fire, windthrow, insect infestation, or other catastrophe. Such harvest would be accomplished under special silvicultural prescriptions designed to meet the needs of nontimber allocations made on these lands.
- Provide for the safety of forest users (including removing hazard trees along roads and trails, in camp grounds, and administrative sites, etc.).
- Facilitate construction, operation, and maintenance of new facilities such as roads, trails, power lines, communication facilities, recreation or administrative facilities, etc.
- Scientific or research studies.
- Isolate and release Douglas-fir, sugar pine, or other individual test trees.
- Maintain or enhance fish and wildlife habitats.
- Facilitate development of mines, quarries, or fluid mineral leases.
- Modify high fuel hazard areas by construction of shaded fuel breaks and/or increase defensible space for fire suppression by maintenance of early seral stage conditions. Such activity could occur to provide protection for timber production areas, old growth blocks, or developed recreational facilities.
- To provide more logical logging units limited timber harvest could occur on TPCC withdrawn lands.
- Rights-of-way.
- Salvage of mortality volume in areas not allocated to timber production could occur if consistent with the objectives of the allocation.
- Forest health treatments.

Management Actions/Direction for Timber Management within Matrix Lands

Matrix lands are where most timber harvest and other silvicultural activities will be conducted within suitable forestlands, according to the following management actions/direction.

Provide a renewable supply of large down logs well distributed across the Matrix lands in a manner that meets the needs of species and provides for ecological functions. Down logs will reflect the species mix of the original stand.

- Leave a minimum of 120 linear feet of logs per acre greater than or equal to 16 inches in diameter and 16 feet long. Decay class 1 and 2 logs will be credited toward the total. Where this management actions/direction cannot be met with existing coarse woody debris, merchantable material will be used to make up the deficit.
- In areas of partial harvest, apply the same basic management actions/direction, but they can be modified to reflect the timing of stand development cycles.
- Retain coarse woody debris already on the ground and protect it to the greatest extent possible from disturbance during treatment (e.g., slash burning and yarding).

Retain 100 acres of the best northern spotted owl habitat as close as possible to a nest site or owl activity center for all known (as of January 1, 1994) northern spotted owl activity centers.

Retain late-successional forest patches in landscape areas where little late-successional forest persists. This management actions/direction will be applied in fifth field watersheds (20 to 200 square miles) in which federal forestlands are currently comprised of 15 percent or less late-successional forest. (The assessment of 15 percent will include all federal land allocations in a watershed.) Within such an area, protect all remaining late-successional forest stands. Protection of these stands could be modified in the future when other portions of a watershed have recovered to the point where they could replace the ecological roles of these stands.

Provide a renewable supply of large live trees and snags well distributed across the Matrix lands in a manner that provides habitat for cavity using birds, bats, and other species; provides structure and habitat diversity; provides future sources of large down logs; and provides for other ecological functions. Retained live trees and snags will reflect the species mix of the original stand. Emphasize retention of the larger trees and snags available to provide the unique structure and functions associated with these large old trees.

- Within the General Forest Management Area north of Grants Pass (northern GFMA) retain at least 6 to 8 green conifer trees per acre in regeneration harvest units.

- Within the General Forest Management Area south of Grants Pass (southern GFMA) retain at least 16 to 25 green conifer trees per acre in regeneration harvest units.

Retain snags and trees within a timber harvest unit at levels sufficient to support species of cavity-nesting birds at 40 percent of potential population levels. Meet the 40 percent minimum throughout the Matrix with per-acre requirements met on average areas no larger than 40 acres.

Modify site treatment practices, particularly the use of fire and pesticides, and modify harvest methods to minimize soil and litter disturbance. Plan and implement treatments to:

- Minimize intensive burning unless appropriate for certain specific habitats, communities, or stand conditions. Prescribed fires should be planned to minimize the consumption of litter and coarse woody debris.

- Minimize soil and litter disturbance that may occur as a result of yarding and operation of heavy equipment.

- Reduce the intensity and frequency of site treatments.

Retain some large hardwood trees, where present in harvest units, to provide habitat diversity.

Management Actions/Direction - Connectivity/ Diversity Blocks Spaced Throughout the Matrix Lands in the Northern GFMA:

Maintain at least 25 to 30 percent of each block in late-successional forest. Riparian reserves and other allocations with late-successional forest count toward this percentage. Blocks may be comprised of contiguous or noncontiguous BLM-administered land. The size and arrangement of habitat within a block will provide effective habitat to the extent possible.

Retain at least 12 to 18 green conifer trees per acre in regeneration harvest units.

Management Actions/Direction - All Land Use Allocations

To mitigate damage caused by *Phytophthora lateralis*, an introduced root disease which is fatal to Port-Orford cedar, all management activities occurring within the range of Port-Orford cedar will conform to the guidelines described in the BLM Port-Orford Cedar Management Plan. Site specific analyses for projects within the range of Port-Orford cedar will consider possible effects on the species.

Special Forest Products

Objectives

Manage for the production and sale of special forest products (SFPs) when demand is present and where actions taken are consistent with primary objectives for the land use allocation.

Use the principles of ecosystem management to guide the management and harvest of special forest products.

Land Use Allocations

No land use allocations are made specifically for special forest products.

Management Actions/Direction

Management Actions/Direction - Riparian Reserves

Where catastrophic events result in degraded riparian conditions, allow fuelwood cutting if required to attain aquatic conservation strategy and riparian reserve objectives.

Management Actions/Direction - Late-Successional Reserves

Permit fuelwood gathering only in existing cull decks, in areas where green trees are marked by silviculturists for thinning, in areas where blowdown is blocking roads, and in recently harvested timber sale units where down material will impede scheduled post-sale activities or pose an unacceptable risk of future large scale disturbance. In all cases, these activities will comply with management actions/ direction for late-successional reserves.

Evaluate whether special forest product harvest activities have adverse effects on late-successional reserve objectives.

Design the sale of special forest products to ensure the protection of other resource values such as special status plants or animal species.

Where special forest product activities are intensive, evaluate whether they have significant effects on late-successional habitat. Restrictions may be appropriate in some cases.

Management Actions/Direction - All Land Use Allocations

Allow harvest of SFPs throughout the district, but apply area and plant species/group restrictions as specified below.

Area	Limited Harvest	No Harvest
Areas of critical environmental concern		X
Research natural areas		X
Outstanding natural areas		X
Environmental education areas		X
Special habitats	X	
White oak woodlands	X	
Developed recreation sites	X	
Known cultural resource sites	X	
Designated wetlands		X
Fragile soils areas	X	
Special status fauna or flora sites		X
Connectivity/Diversity blocks	X	
Late-successional reserves	X	
Riparian reserves	X	
Key watersheds	X	

Plant Species or Group	Limited Harvest	No Harvest
Lily family (*Liliaceae*) except beargrass		X
Orchid family (*Orchidaceae*)		X
Iris family (*Iricacidae*) except common iris		X
Special status plant species		X
Truffles	X	
Lichens	X	
Ferns	X	
Conifer boughs	X	
Port-Orford cedar boughs	X	
Darlingtonia		X
Mosses	X	
Mushrooms	X	

Establish specific guidelines for the management of individual SFPs using interdisciplinary review as needed. Management guidelines would be based on the ecological characteristics of the SFP species and the requirements of associated plant, animal, and fungal species. Guidelines will include provisions that minimize changes in site productivity. Monitoring of harvest activities and the effects of harvest would be part of SFP management. Feasibility to harvest newly identified SFP species would receive interdisciplinary review.

Energy and Minerals

Objectives

Maintain exploration and development opportunities for leasable and locatable energy and mineral resources.

Provide opportunities for extraction of salable minerals by the BLM, other government entities, private industry, individuals, and nonprofit organizations.

Land Use Allocations

See Table S-1 for energy and mineral allocations. Most BLM-administered lands will remain open to mineral exploration and development. However, various restrictions may apply.

Management Actions/Direction

See Tables 2-6, 2-7, and 2-8 for restrictions on energy and mineral activities, and Appendices 2-EM-1/1a, 2-EM-2/2a, and 2-EM-3/3a for leasing stipulations and operating standards pertinent to locatable and salable minerals.

Management Actions/Direction - Riparian Reserves

NOTE: The standards and guidelines for minerals management in riparian reserves presented on page C-34/35 of the SEIS ROD are not consistent with BLM regulations. Until regulations are modified, management of locatable minerals within riparian reserves will be governed by regulations found in 43 CFR 3809. The following guidelines consistent with 43 CFR 3809, are modifications of the standards and guidelines presented in the SEIS ROD and apply to any locatable mineral operations requiring a plan of operations and to leasable and saleable mineral operations, where appropriate.

- Require a Plan of Operations, including a reclamation plan and reclamation bond for all mining operations in riparian reserves. Such plans and bonds will address the costs of removing facilities, equipment, and materials; recontouring of disturbed areas to an approved topography; isolating and neutralizing or removing toxic or potentially toxic materials; salvaging and replacing topsoil; and revegetating to meet aquatic conservation strategy and riparian reserve objectives.
- Locate structures, support facilities, and roads outside riparian reserves. If no alternative to siting facilities in riparian reserves exists, locate in a way compatible with aquatic conservation strategy and riparian reserve objectives. Road construction will be kept to the minimum necessary for the approved mineral activity. Roads will be constructed and maintained to meet road management standards and to minimize damage to resources in riparian reserves. When a road is no longer required for mineral or land management activities, it will be reclaimed. In any case, access roads will be constructed consistent with 43 CFR 3809 and acceptable road construction standards and will minimize damage to resources in riparian reserves.
- Avoid locating solid and sanitary waste facilities in riparian reserves. If no alternative to locating mine waste (waste rock, spent ore, tailings) facilities in riparian reserves exists, and if releases can be prevented and stability can be ensured.
- Analyze the waste material using the best conventional sampling methods and analytic techniques to determine its chemical and physical stability characteristics.
- Locate and design the waste facilities using best conventional techniques to ensure mass stability and prevent the release of acid or toxic materials. If the best conventional technology is not sufficient to prevent such releases and ensure stability over the long term, prohibit such facilities in riparian reserves.
- Reclaim waste facilities after operations to ensure chemical and physical stability and to meet aquatic conservation strategy and riparian reserve objectives.
- Monitor waste and waste facilities after operations to ensure chemical and physical stability and to meet aquatic conservation strategy and riparian reserve objectives.
- Require reclamation bonds adequate to ensure chemical and physical stability and to meet aquatic conservation strategy and riparian reserve objectives.
- Where an existing operator is in noncompliance at the notice level (i.e., causing unnecessary or undue degradation), require actions similar to those stated above to meet the intent of 43 CFR 3809.
- Develop inspection and monitoring requirements and include such requirements in exploration and mining plans and in leases or permits consistent with existing laws and regulations. Evaluate the results of inspection and monitoring to determine if modification of plans, leases and permits is needed to eliminate impacts that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.
- For leasable mineral activity in riparian reserves, prohibit surface occupancy for oil, gas, and geothermal exploration and development activities where leases do not exist. Where possible, adjust the stipulations in existing leases to eliminate impacts that retard or prevent the attainment of aquatic conservation strategy and riparian reserve objectives, consistent with existing lese terms and stipulations.
- Allow development of saleable minerals, such as sand and gravel, within riparian reserves only if aquatic conservation strategy and riparian reserve objectives can be met.

Management Actions/Direction - Late-Successional Reserves

Assess the impacts of ongoing and proposed mining activities in late-successional reserves.

Include stipulations in mineral leases and, when legally possible, require operational constraints for locatable mineral activities to minimize detrimental effects on late-successional habitat.

Management Actions/Direction - All Land Use Allocations

Management Actions/Direction - Leasable Minerals

Standard oil and gas lease stipulations are listed in Section 6 of "Offer to Lease and Lease for Oil and Gas" Form 3100-1 (see Appendix 2-EM-1, Draft RMP).

Special stipulations will be attached to oil and gas leases to provide additional protection for fragile areas or critical resource values. A seasonal restriction could be used to protect critical wildlife habitat or prevent excessive erosion, etc. A controlled-use stipulation could be used to protect valuable resources in very small areas. A no surface occupancy (NSO) stipulation could be used to protect valuable resources spread over a large area while still providing an opportunity for exploration and development. The NSO stipulation will be used within riparian reserves.

Special stipulations for leasable minerals are shown in Appendix M. The special stipulations regarding seasonal restrictions, controlled surface use, and prohibiting surface occupancy could be waived by authorized BLM officials if the objective of the stipulation would be met in another manner or if the resource being protected was no longer present.

Examples of special stipulations include:

- leasing designated special areas with a NSO restriction;
- leasing in big game winter range with a seasonal restriction; and
- leasing of meadows or wetlands with a controlled surface-use restriction.

Tables 2-6 and 2-7 illustrate the federal mineral estate in the planning area on which oil and gas and geothermal activities, respectively, could be restricted by alternative.

Management Actions/Direction - Locatable Minerals

Areas not specifically withdrawn from mineral entry will continue to be open under the mining laws. Mineral exploration and development will be regulated under 43 CFR 3802 and 3809 to prevent "unnecessary or undue degradation".

All surface disturbance from operations, whether conducted under a notice or plan of operations, will be reclaimed at the earliest feasible time.

The standards that govern activities conducted under a notice of operations (effecting five acres or less) and those that govern activities under a plan of operations (effecting more than five acres) are also shown in Appendix N and Table 2-8.

Additional guidelines governing mining activities are discussed below.

- All instream placer mining would be closed to suction dredging for the time specified in Oregon Guidelines for "Timing of In-Water Work" to protect fish and wildlife resources. Waivers could be granted by Oregon Department of Fish and Wildlife.
- Mining operations within riparian reserves will be subject to mitigation measures whether conducted under a notice or a plan of operations. Mitigating measures will be developed to prevent degradation of water quality including siltation and water temperature and to comply with Executive Order 11190 (Protection of Wetlands). Road construction, clearing vegetation, hazard tree removal, mining waste disposal, and other surface-disturbing activities that would degrade water quality or riparian/wetland habitat will either be prohibited or require special mitigation. These activities within riparian reserves will be considered unnecessary or undue degradation unless acceptable mitigation measures are approved in advance. Mining activities will conform to best management practices (BMPs) to protect water quality (see Appendix F, and Aquatic Conservation Strategy and Riparian Reserve objectives).
- Mining activities within LSRs will be designed to mitigate detrimental effects.

- Mining operations will be allowed in designated ACECs but only in a manner that would not impair or degrade those significant resource values which lead to area of critical environmental concern (ACEC) designation. A plan of operations will be required in all designated ACECs. A plan of operations will not be approved if operations would irreparably damage those resource values for which the ACEC was designated.

- Mining operations will not be allowed to disturb lands classified fragile nonsuitable woodlands under the timber production capability classification (TPCC) unless adequate mitigation measures are implemented to prevent slope failures, damage to soil productivity, or erosion.

- Mining operations in lands classified VRM Class II will maintain the existing visual characteristics of the landscape. Evidence of exploration and development activities will be reclaimed to meet VRM Class II management objectives. All disturbed lands will be graded to near natural contours where practical and revegetated with native plants.

- All mining activity employing suction dredges will comply with Oregon State Department of Environmental Quality Permit No. 0700.

- All mining activities discharging waste water will comply with Oregon State Department of Environmental Quality Permit No. 0600.

A number of areas/sites have been proposed to be withdrawn from mineral entry under the mining laws. These areas/sites will also be closed to disposal of saleable minerals and be made available for exploration and development of leasable minerals with NSO stipulation or not at all. Withdrawals from mineral entry would be pursued for the areas/sites discussed below.

- All existing withdrawals carried forward are listed in Table 2-5.

- Withdrawals from mineral entry will be pursued for research natural areas (RNAs) to protect the ecosystems being monitored as baseline data.

- Rivers or streams eligible for inclusion in the Wild and Scenic Rivers Systems and proposed for designation as Wild, will be withdrawn from mineral entry to conform with the Wild and Scenic Rivers Act, upon designation.

- A withdrawal from mineral entry will be pursued for that portion of the recreation section of the Rogue River downstream from Yew Wood Creek, not presently withdrawn from mineral entry, to conform with other segments of the designated river section and to conform with the existing management plan.

- Mineral withdrawals will be pursued for all sites with significant capital improvements such as administrative sites, reaches of streams with fish improvements, and developed recreation sites following initiation of the investment.

- A withdrawal from mineral entry will be pursued for the Jacksonville Trail System. BLM and the city of Jacksonville plan to establish a trail system for recreation purposes. Any mining would impair the trail improvements and scenic values.

- A withdrawal from mineral entry will be pursued for Agate Flat, a well-known agate collecting area frequented by rock clubs and collectors, to keep the area open to the public.

- A withdrawal from mineral entry will be pursued for Galice Creek for recreational and cultural values.

Management Actions/Direction - Saleable Minerals

Saleable minerals, including common varieties of sand, gravel, rock, and stone, will be made available for local governments, private industry, individuals, and nonprofit organizations consistent with management objectives of other resources and consistent with the requirement that undue or unnecessary degradation be prevented. Most of these needs will be met from community pits located throughout the planning area.

Rock quarries will continue to be used to provide rock for use in construction and maintenance of timber sale access roads and for other purposes. New quarry sites will be developed as needed if they are consistent with the management objectives of other resource values. All quarry development will include development and reclamation plans. Long-term regional quarry use will be emphasized. A districtwide quarry management plan will be developed to address development standards and reclamation goals.

Saleable mineral activities within riparian reserves will occur only if Aquatic Conservation Strategy objectives can be met. Activities within LSRs will be designed to mitigate detrimental effects.

Guidelines and restrictions for development of saleable minerals are presented in Appendix O.

Management Actions/Direction - Reserved Federal Mineral Estate

The reserved federal mineral estate (federal minerals underlying nonfederal surface) would continue to be open for mineral development in the same manner and degree as adjacent BLM-administered land. Conveyances of mineral interest owned by the United States where the surface is or will be in nonfederal ownership could be made to the existing or proposed owner of the surface estate consistent with FLPMA Section 209(b).

Socioeconomic Conditions

Objectives

Contribute to local, state, national, and international economies through sustainable use of BLM-managed lands and resources and use of innovative contracting and other implementation strategies.

Provide amenities (e.g., recreation facilities, protected special areas, and high quality fisheries) that enhance communities as places to live and work.

Land Use Allocations

There are no specific land use allocations related to socioeconomic conditions. However, allocations such as the general forest management area, the Applegate adaptive management area, special area designations, and provision of recreation opportunities can assist in meeting socioeconomic objectives.

Management Actions/Direction

Support and assist the State of Oregon Economic Development Department's efforts to help rural, resource-based communities develop and implement alternative economic strategies as a partial substitute for declining timber-based economies. Aid and support could include: increased coordination with state and local governments and citizens to prioritize BLM management and development activities, increased emphasis on management of special forest products, and recreation development and other activities identified by BLM and the involved communities as benefiting identified economic strategies.

Improve wildlife and fish habitat to enhance hunting and fishing opportunities and to increase the economic returns generated by these activities.

Improve viewing opportunities for watchable wildlife within the planning area.

Designate new viewing areas for unidentified wildlife and wildflowers.

Design and implement forest management activities to produce a sustained yield of products to support local and regional economic activity. A diversity of forest products (timber and nontimber) will be offered to support large and small commercial operations and provide for personal use. Service contracts will include opportunities for both large and small contractors.

Land Tenure Adjustments

Objectives

Make land tenure adjustments to benefit a variety of uses and values. Emphasize opportunities that conserve biological diversity or enhance timber management opportunities. As a matter of practice, O&C forestlands allocated to timber management would only be exchanged for lands to be managed for multiple-use purposes.

Meet the following objectives for the three land tenure adjustment zones:

- Zone 1: generally, retain these lands under BLM administration.
- Zone 2: "block up" areas in Zone 2 with significant resource values and exchange other lands in Zone 2 to "block up" areas in Zones 1 and 2 with significant resource values.
- Zone 3: retain lands with unique resource values; dispose of other lands in this zone using appropriate disposal mechanisms, including sale.

Make BLM-administered lands in Zones 1, 2, and 3 available for a variety of uses as authorized by section 302 of the Federal Land Policy and Management Act, the Recreation and Public Purposes Act, and special recreation permits.

Manage newly acquired lands for the purpose for which they are acquired or consistent with the management objectives for adjacent BLM-administered lands. If lands with unique or fragile resource values are acquired, protect those values until the next plan revision.

Land Use Allocations

Zone	Acres
Zone 1	292,100
Zone 2	558,600
Zone 3	7,600

See Map 2-2 for location of land tenure zones and Appendix Q for legal descriptions of Zone 3 lands.

Management Actions/Direction

Management Actions/Direction - Riparian Reserves

Use land acquisition, exchange, and conservation easements to meet aquatic conservation strategy and riparian reserve objectives, and facilitate restoration of fish stocks and other species at risk of extinction.

Management Actions/Direction - Late-Successional Reserves

Consider land exchanges when they will provide benefits equal to or better than current conditions.

Consider land exchanges especially to improve area, distribution, and quality (e.g., connectivity, shape, and contribution to biological diversity) of late-successional reserves where public and private lands are intermingled.

Management Actions/Direction - All Land Use Allocations

Use the land tenure adjustment criteria shown in Appendix P when conducting environmental analyses for site-specific proposals. Application of these criteria may result in retention of some zone 3 lands.

Maintain or increase public land holdings in Zone 1 by retaining public lands and acquiring nonfederal lands with high public resource values. The primary mode of acquisition will be through exchange of BLM-administered lands in Zones 2 and 3. Utilize purchases and donations if exchange is not feasible. All fee acquisitions will be with willing sellers.

Consult with county governments prior to any exchange, especially those involving O&C land.

Consider the effect of land tenure adjustments on the mineral estate. If the lands are not known to have mineral potential, the mineral estate will normally be transferred simultaneously with the surface estate.

Minimize impact on local tax base by emphasizing exchanges rather than fee purchase.

Make exchanges to enhance public resource values and/or improve land patterns and management capabilities of both private and BLM-administered land within the planning area by consolidating ownership and reducing the potential for land use conflict.

Consider transfer of BLM-administered land to other Federal agencies or acquisition of other Federal lands where consistent with public land management policy and where improved management efficiency will result.

Prohibit disposal of Zone 2 lands through sales under Section 203(a) of FLPMA. Zone 2 lands may be transferred to other public agencies or managed under some form of cooperative agreement. However, Zone 2 lands will generally remain under BLM-administration.

Dispose of Zone 3 lands through sale under Section 203(a) of FLPMA if no viable exchange proposals can be identified. Zone 3 lands could also be transferred to another Federal agency or state or local government as needed, to accommodate community expansion or other public purposes.

Realign the Coos Bay/Medford district boundaries and sustained yield unit boundaries to administratively transfer jurisdiction of the land in the O'Brien-Takilma area from the Coos Bay District to the Medford District.

Adjust landownership patterns with the Rogue and Siskiyou National Forests to enhance management efficiency.

Continue the Hyatt Lake homesite leasing program as currently managed.

Rights-of-Way

Objectives

Continue to make BLM-administered lands available for needed rights-of-way where consistent with local comprehensive plans, Oregon statewide planning goals and rules, and the exclusion and avoidance areas identified in this PRMP.

Ensure that all rights-of-way for hydroelectric development are consistent with the Northwest Power Planning Council guidance, which recommends prohibiting future hydroelectric development on certain rivers and streams with significant fisheries and wildlife values.

Land Use Allocations

Allocation of lands to existing rights-of-way corridors and communication sites will continue.

Locations are shown on Map 3-1.

Subject to valid existing rights and with the exception of buried lines in rights-of-way of existing roads, exclude rights-of way in the following areas:

- Research natural areas,
- Wild rivers (those found suitable for designation and those already designated),
- Wilderness study areas,
- Wilderness areas,
- Visual resource management Class I Areas, and
- Known special status plant species sites.

With the exception of buried lines in rights-of-way of existing roads, avoid locating rights-of-way in the following areas:

- Recreation sites (existing and proposed),
- Areas of critical environmental concern (not designated as research natural areas),
- Scenic and recreational rivers (those found suitable for designation and those already designated),
- Sensitive species habitat,
- Visual resource management Class II areas,
- Known wetlands, and
- Late-successional reserves.

Rights-of-way may be granted in avoidance areas when no feasible alternative route or designated right-of-way corridor is available.

Management Actions/Direction

Management Actions/Direction - Riparian Reserves

Issue rights-of-way to avoid adverse effects that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives. Where legally possible, adjust existing rights-of-way to eliminate adverse effects that retard or prevent the attainment of aquatic conservation strategy and riparian reserve objectives. If adjustments are not effective and where legally possible, eliminate the activity. Priority for modifying existing rights-of-way will be based on the actual or potential impact and the ecological value of the riparian resources effected.

For proposed hydroelectric projects under the jurisdiction of the Federal Energy Regulatory Commission (the Commission), provide timely, written comments regarding maintenance of instream flows and habitat conditions and maintenance/ restoration of riparian resources and stream channel integrity. Request the Commission to locate proposed support facilities outside of riparian reserves. For existing support facilities inside riparian reserves that are essential to proper management, provide recommendations to the Commission that ensure aquatic conservation strategy and riparian reserve objectives are met. Where these objectives cannot be met, provide recommendations to the Commission that such support facilities should be relocated. Existing support facilities that must be located in the riparian reserves should be located, operated, and maintained with an emphasis to eliminate adverse effects that retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.

For other hydroelectric and surface water development proposals in Tier One key watersheds, require instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies. For other hydroelectric and surface water development proposals in all other watersheds, give priority emphasis to instream flows and habitat conditions that maintain or restore riparian resources, favorable channel conditions, and fish passage. Coordinate this process with the appropriate state agencies.

Management Actions/Direction - Late-Successional Reserves

Retain and maintain existing developments, such as utility corridors and electronic sites, consistent with other management actions/direction for late-successional reserves.

Neither construct nor authorize new facilities that may adversely effect late-successional reserves.

Review on a case-by-case basis new development proposals. They may be approved when adverse effects can be minimized and mitigated.

Locate new developments to avoid degradation of habitat and adverse effects on identified late-successional species.

Remove hazard trees along utility rights-of-way and in other developed areas.

Management Actions/Direction - Other Land Use Allocations

Encourage location of major new rights-of-way projects in existing utility/transportation routes and other previously designated corridors.

Encourage applicants to consult the Western Regional Corridor Study in planning route locations.

Consider new locations for rights-of-way projects on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing route or corridor would not be technically or economically feasible; and the proposed project would otherwise be consistent with this proposed resource management plan and would minimize damage to the environment.

Allow expansion of communications facilities on existing communication sites consistent with protection of threatened and endangered species.

Consider new communication sites on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of an existing, developed communication site would not be technically feasible; and the proposed facility would otherwise be consistent with this proposed resource management plan and would minimize damage to the environment.

Access

Objectives

Acquire access to public lands to assist various programs to meet management objectives.

Land Use Allocations

None.

Management Actions/Direction

Acquire access by obtaining easements, entering into new reciprocal right-of-way agreements, or amending existing reciprocal right-of-way agreements. Condemnation for access will be pursued when necessary.

Acquire perpetual exclusive easements whenever possible to provide for public access and BLM control. Acquire nonexclusive easements, which do not provide for public access, consistent with management objectives and where no public access is needed. Acquire temporary easements only when other options are not available.

Continue to obtain access across lands of private companies or individuals who are a party (permittee) to existing reciprocal rights-of-way agreements through appropriate agreements. Whenever a willing permittee is identified and it is determined there is a need for public access, negotiations could be started to provide for the acquisition of public access rights.

Emphasize acquisition for public access on major travel routes.

Withdrawals

Objectives

Protect lands with important resource values and/or significant levels of investment by withdrawing them from the operation of public land and mineral laws. Withdrawal is necessary to avoid irreparable damage that may be caused by nondiscretionary activities.

Land Use Allocations

Recommendations for revocation or continuation of existing withdrawals are shown in Table 2-5.

Additional BLM-proposed mineral withdrawals are shown in the energy and minerals sections.

Management Actions/Direction

Complete the review of existing withdrawals to determine whether continuation of the withdrawal is consistent with the statutory objectives of the programs for which the lands were dedicated and with other important programs.

Terminate unnecessary or duplicative withdrawals and continue those which still meet the intent of the withdrawal.

Implement the BLM-proposed withdrawals listed under land use allocations. This will involve recommendations to and approval by the Secretary of the Interior.

Evaluate future withdrawal proposals for compliance with program objectives and federal law and recommend appropriate action to the Secretary of the Interior.

Limit withdrawals to the minimum area needed and restrict only those activities that would be detrimental to the purposes of the withdrawal.

Pursue mineral withdrawals in all resource natural areas.

Also see Management of Newly Acquired Lands located near the end of this chapter.

Roads

Objectives

Develop and maintain a transportation system that serves the needs of users in an environmentally sound manner. Arterial and major collector roads will form the backbone of the transportation system in the planning area.

Correct problems associated with high road density by emphasizing the reduction of minor collector and local road densities where those problems exist.

Manage roads to meet the needs identified under other resource programs (e.g., seasonal road closures for wildlife). Road management is mentioned or implied primarily under aquatic conservation strategy and riparian reserve, late-successional reserves, Water and Soil, Wildlife, Fish Habitat, Special Status and SEIS Special Attention Species Habitat, Timber Resources and Recreation.

Land Use Allocations

There are approximately 24,000 acres (4,455 miles) of roads on BLM-administered land in the district.

Management Actions/Direction

Management Actions/Direction - Riparian Reserves

Cooperate with federal, state, and county agencies and work with parties with road use agreements to achieve consistency in road design, operation, and maintenance necessary to attain aquatic conservation strategy and riparian reserve objectives.

For each existing or planned road, meet aquatic conservation strategy and riparian reserve objectives by:

- completing watershed analyses, including appropriate geotechnical analyses (i.e., examining soil and rock conditions in riparian and stream crossings) prior to construction of new roads or landings in riparian reserves;
- minimizing road and landing locations in riparian reserves;
- preparing road design criteria, elements, and standards that govern construction and reconstruction;
- preparing operation and maintenance criteria that govern road operation, maintenance, and management;
- minimizing disruption of natural hydrologic flow paths, including diversion of streamflow and interception of surface and subsurface flow;
- restricting sidecasting as necessary to prevent the introduction of sediment to streams; and
- avoiding wetlands entirely when constructing new roads.

Determine the influence of each road on the aquatic conservation strategy and riparian reserve objectives through watershed analysis. Meet aquatic conservation strategy and riparian reserve objectives by:

- reconstructing roads and associated drainage features that pose a substantial risk;
- prioritizing reconstruction based on current and potential impact to riparian resources and the ecological value of the riparian resources affected; and
- closing and stabilizing, or obliterating and stabilizing roads based on the ongoing and potential effects to aquatic conservation strategy and riparian reserve objectives and considering short-term and long-term transportation needs.

New culverts, bridges, and other stream crossings shall be constructed; and existing culverts, bridges, and other stream crossings determined to pose a substantial risk to riparian conditions will be improved to accommodate at least the 100-year flood, including associated bedload and debris. Priority for upgrading will be based on the potential impact and the ecological value of the riparian resources affected. Crossings will be constructed and maintained to prevent diversion of streamflow out of the channel and down the road in the event of crossing failure.

Minimize sediment delivery to streams from roads. Outsloping of the roadway surface is preferred, except in cases where outsloping would increase sediment delivery to streams or where outsloping is infeasible or unsafe. Route road drainage away from potentially unstable channels, fills, and hillslopes.

Provide and maintain fish passage at all road crossings of existing and potential fish-bearing streams (e.g., streams which can be made available to anadromous fish by removing obstacles to passage).

Develop and implement a Road Management Plan or a Transportation Management Plan that meets the aquatic conservation strategy and riparian reserve objectives. As a minimum, this plan will include provisions for the following activities:

- inspections and maintenance during storm events,
- inspections and maintenance after storm events,
- road operation and maintenance giving high priority to identifying and correcting road drainage problems that contribute to degrading riparian resources,
- traffic regulation during wet periods to prevent damage to riparian resources, and
- establishing the purpose of each road by developing the road management objective.

Management Actions/Direction - Late-Successional Reserves

Construct roads in Late-successional reserves if the potential benefits of silviculture, salvage, and other activities exceed the costs of habitat impairment. If new roads are necessary to implement a practice that is otherwise in accordance with these guidelines, they will be kept to a minimum, routed through unsuitable habitat where possible, and designed to minimize adverse impacts. Alternative access, such as aerial logging, should be considered to provide access for activities in reserves.

Remove trees along rights-of-way if they are a hazard to public safety. Consider leaving material on site if existing coarse woody debris is inadequate. Consider topping of trees as an alternative to felling.

Management Actions/Direction - Key Watersheds

Reduce existing road mileage within key watersheds. If funding is insufficient to implement reductions, neither construct nor authorize through discretionary permits a net increase in road mileage in key watersheds.

Management Actions/Direction - All Land Use Allocations

Prepare a districtwide road management plan. The management plan will specifically address recreation use, road densities, road closures, wildlife protection, water quality, Port-Orford cedar management, timber management, construction and maintenance standards, fire suppression access, and coordination with adjacent landowners. Address road management planning on a watershed basis consistent with late-successional reserves, riparian reserves, and other major allocations. Specific road closures would be determined using standard analysis, public involvement, and notification procedures.

Determine standards for new road construction during the project planning process. Standards will be the minimum necessary to meet resource and allocation objectives (e.g., recreation site, timber sale, key watershed, etc.) while having minimal impacts on the environment.

Minimize new road construction in areas with fragile soils (granitic, schist, and pyroclastic soils) to reduce impacts to soils, water quality, and fisheries. Stabilize existing roads where they contribute to significant adverse effects on these resources.

Locate, design, construct, and maintain roads to standards that meet management objectives in accordance with the district road management plan.

Follow best management practices (see Appendix F) for water quality and soil productivity to mitigate adverse effects on soils, water quality, fish, and riparian habitat during road construction and maintenance.

Reduce road density by closing minor collector and local roads in areas or watersheds where water quality degradation, big game harassment, or other road related resource problems have been identified.

Acquire water rights for road management purposes.

Specifically address, either in the road management plan or in a watershed analysis, stabilizing existing roads located on fragile granitic, schist, and pyroclastic soils (e.g., West Evans Creek and the Upper Lake Creek drainages), watersheds with water quality limited streams, and other areas of the district where soil/water quality problems are known to exist.

Avoid road construction in special areas and special habitats.

Manage and design road systems to reduce public health and safety hazards, fire risks, and vandalism to public and private property. Of particular concern is unauthorized public use of nonthrough or "local" roads within rural interface areas and within one-quarter mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate.

Reduce the further spread of blackstain fungus through proper timing of roadside brushing.

Determine necessity of road systems to meet initial wildfire suppression objectives prior to any prepared closure or modification.

Rural Interface Areas

Objectives

Consider the interests of adjacent and nearby rural residential land owners during analysis, planning and monitoring activities occurring within managed rural interface areas (RIAs). These interests include personal health and safety, improvements to property, and quality of life. Determine how land owners might be or are effected by activities on BLM-administered lands.

Land Use Allocations

Managed rural interface areas encompass approximately 135,700 acres of BLM-administered land within one-quarter mile of private lands zoned for 1-5 acre or 5-20 acre lots located throughout the Medford District (see Map 2-7 for locations and Table 2-16 for acres).

Management Actions/Direction

Work with local governments to improve management of activities within RIA.

As a part of watershed analysis and project planning, work with local individuals and groups including fire protection districts to identify and address concerns related to possible impacts of proposed management activities on rural interface areas.

Use design features and mitigation measures to avoid/minimize impacts to health, life and property, and quality of life. Examples include different harvest regimes, hand application rather than aerial application of herbicides and pesticides, and hand piling slash for burning as opposed to broadcast burning. Monitor the effectiveness of design features and mitigation measures.

Eliminate or mitigate public hazards such as abandoned mine tunnels and quarries.

Manage rural interface areas using visual resource management Class III standards (unless an area is otherwise classified as visual resource management Class I or II).

Manage and design road systems to reduce public health and safety hazards, fire risks, and vandalism to public and private property. Of particular concern is unauthorized public use of nonthrough or "local" roads within rural interface areas and within one-quarter mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate.

Use dust abatement measures on roads during BLM timber harvest operations or other BLM commodity hauling. Encourage and enforce the use of dust abatement measures when haulers use BLM roads under permits and right-of-way agreements.

Reduce natural fuel hazards on BLM-administered lands in rural interface areas.

Protect resources on BLM-administered land from potential wildfires originating on adjacent private land by using prescribed fire to reduce fuel hazards. The use of low intensity underburning is the preferred technique.

Fire Management

Objectives

Provide appropriate wildfire suppression responses that will help meet resource management objectives.

Use prescribed fire to meet resource management objectives. This will include but not be limited to fuels management for wildfire hazard reduction, restoration of desired vegetation conditions, management of habitat, and silvicultural treatments.

Adhere to smoke management and air quality standards of the Clean Air Act and State Implementation Plan for prescribed burning.

Land Use Allocations

None.

Management Actions/Direction

Management Actions/Direction - General

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Address fire/fuels management for all land use allocations as part of watershed analysis. This will include determinations of the role of fire and the risk of large-scale, high intensity wildfires at the landscape level.

Coordinate fire management activities in rural interface areas with local governments, agencies, and landowners. During watershed analysis, identify additional factors that may effect hazard reduction goals. Minimize the impacts of wildfire suppression actions.

Management Actions/Direction - Riparian Reserves

Determine the probable risk of large-scale, high intensity wildfires, which would prevent or delay the attainment of aquatic conservation strategy and riparian reserve objectives through the period established for retention. Describe the need to use prescribed fire to reduce fuel hazards and the risk of large-scale, high intensity wildfires.

Design fuel treatment and fire suppression strategies, practices, and activities to meet aquatic conservation strategy and riparian reserve objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies will recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuel management activities could be damaging to long-term ecosystem function.

Locate incident bases, camps, helibases, staging areas, helispots and other centers for incident activities outside of riparian reserves. If the only suitable location for such activities is within the riparian reserve, an exemption may be granted following a review and recommendation by a resource advisor. The Area Manager, through the resource advisor, will prescribe the location, use conditions, and rehabilitation requirements. Normally these activities will be included with the Wildfire Situation Analysis.

Minimize delivery of chemical retardant, foam, or other additives to surface waters. An exception may be warranted in situations when immediate safety imperatives exist, or, following a review and recommendation by a resource advisor, increases in fire size would cause substantial long-term, unacceptable resource damage.

Establish an emergency team to develop a rehabilitation treatment plan to attain aquatic conservation strategy and riparian reserve objectives whenever the reserves are significantly damaged by a wildfire or a prescribed fire burning outside of prescribed parameters.

Consider allowing some natural fires to burn when they are identified as being consistent with aquatic conservation strategy and riparian reserve objectives, and upon completion and approval of a fire management plan.

Mop-up plans for both prescribed and wildfires should consider rapidly extinguishing smoldering coarse woody debris and duff.

Locate and manage water drafting sites (sites where water is pumped to suppress fires) to minimize adverse effects on riparian habitat and water quality consistent with aquatic conservation strategy and riparian reserve objectives.

Management Actions/Direction - Late-Successional Reserves

Determine the probable risk of large-scale, high intensity wildfires, which would prevent or delay the attainment of resource management objectives through the period established for retention. Describe the need to use prescribed fire to reduce fuel hazards and the risk of large-scale, high intensity wildfires.

Emphasize maintaining late-successional habitat in wildfire suppression plans.

Manage fuels in accordance with guidelines for reducing risks of large-scale disturbances. Use risk assessment as a tool to allow for interdisciplinary decision making such seeks to prioritize fuel treatment need based on potential loss of critical habitat.

During fire suppression activities, ensure that unacceptable habitat damage from suppression activities is minimized.

Until a fire management plan is completed for a reserve or group of reserves, suppress wildfire to avoid loss of habitat and to maintain future management options. Under an approved fire management plan, allow some natural fires to burn when they are identified as being consistent with resource management objectives.

Prepare a fire management plan as a component of the late-successional reserve assessment, prior to any habitat manipulation activities. Specify fire suppression, fuels management and prescribed fire use to meet resource objectives.

Apply prescribed fire based on the role of fire within each landscape in a manner consistent with ecosystem management objectives, including fuel hazard reduction and retention of coarse woody debris.

During wildfire suppression operations, consider rapidly extinguishing smoldering coarse woody debris, snags, and duff in areas that are deficient of crucial stand components.

Management Actions/Direction - Adaptive Management Areas

Explore and support opportunities to research the role and effects of fire management on ecosystem functions. Test the concepts of using prescribed fire to mitigate long term risk of conflagration type wildfires.

Emphasize fire/fuels management cooperation across agency and ownership boundaries.

Management Actions/Direction - Matrix

Plan and implement prescribed fire treatments designed to minimize:

- intensive burning, unless appropriate for certain specific habitats, communities, or stand conditions;
- consumption of litter and coarse woody debris;
- disturbance to soil and litter that may occur as a result of heavy equipment operations;
- the frequency of treatments; and

Management Actions/Direction - Wildfire Suppression

Minimize the direct negative impacts to wildfire suppression on ecosystem management objectives.

Respond to all wildfires by taking appropriate suppression responses. In most cases, responses will consist of aggressive initial attack to extinguish fires at the smallest size possible.

For wildfires that escape initial attack, perform a Wildfire Situation Analysis to develop a suppression strategy to evaluate the damage induced by suppression activities compared to expected wildfire damage.

Rehabilitation plans should consider the use of available soil seed banks, the use of native species, and/or sterile aliens for both emergency and large scale wildfire rehabilitation work.

Management Actions/Direction - Fuels Management (including Hazard Reduction)

Using prescribed fire throughout the planning area, identify the need for prescribed fire to restore and/or maintain crucial wildlife habitat, key plant associations, plant communities, and fire dependent/adapted species emphasizing special status plant and animal habitat need.

Modify fuel profiles in order to lower the potential of fire ignition and rate of spread; protect and support land use allocation objectives by lowering the risk of high intensity, stand-replacing wildfires; and adhere to smoke management and air quality standards.

Reduce both natural and activity based fuel hazards through methods such as prescribed burning, mechanical or manual manipulation of forest vegetation and debris, removal of forest vegetation and debris, and combinations of these methods.

Management Actions/Direction - Prescribed Fire Use for Ecosystem Maintenance and Restoration

Base the use of prescribed fire on the risk of high intensity wildfire and the associated cost and environmental impacts of using prescribed underburning to meet protection, restoration, and maintenance of crucial stands that are current susceptible to large-scale catastrophic wildfire.

Reintroduce underburning across large areas of the landscape over a period of time to create a mosaic of stand conditions. Treatments should be site-specific because some species with limited distributions are fire intolerant.

Identify opportunities to use prescribed fire to make stands more resistent to wildfire.

Revise, where appropriate, landscape objectives for coarse woody debris, down logs, green-tree retention, and snags, consistent with the natural role of fire and protection standards through the Watershed Analysis Process.

Livestock Grazing

Objectives

Provide for livestock grazing in an environmentally sensitive manner, consistent with management objectives and land use allocations.

Provide for rangeland improvement projects and management practices, consistent with management objectives and land use allocations.

Land Use Allocations

Land use allocations for livestock grazing are described in the Medford District Grazing Environmental Impact Statement and Rangeland Program Summary.

Management Actions/Direction

Management Actions/Direction - Riparian Reserves

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that prevent attainment of aquatic conservation strategy and riparian reserve objectives.

Locate new livestock handling and/or management facilities outside riparian reserves. For existing livestock handling facilities inside riparian reserves, ensure that aquatic conservation strategy and riparian reserve objectives are met. Where these objectives cannot be met, require relocation or removal of such facilities.

Limit livestock trailing, bedding, watering, loading, and other handling efforts to those areas and times that will ensure aquatic conservation strategy and riparian reserve objectives are met.

Management Actions/Direction - Late-Successional Reserves

Implement range-related management activities that do not adversely effect late-successional habitat.

Through a planning and environmental analysis process appropriate to the action, adjust or eliminate grazing practices that retard or prevent attainment of late-successional reserve objectives.

Evaluate effects of existing and proposed livestock management and handling facilities in late-successional reserves to determine if riparian reserve objectives are met. Where objectives cannot be met, relocate livestock management and/or handling facilities.

Management Actions/Direction - All Land Use Allocations

Apply the management actions/direction in the Special Status and SEIS Special Attention Species section.

Evaluate, and take appropriate action, the following concerns when an operator applies to fill the grazing permit to its upper limits of grazing preference following several years of consecutive nonuse:

- Resource conflicts which could require modification of historical grazing use or practices,
- Condition of existing range improvements to accommodate grazing (i.e. fences, water facilities, seedings), and
- Consistency with objectives identified for the allotment or area.

Noxious Weeds

Objectives

Contain and/or reduce noxious weed infestations on BLM-administered land using an integrated pest management approach. Some noxious weeds expected to be subject to control are:

Common Name	Scientific Name
Rush skeleton weed	*Chondrilla juncea*
Tansy ragwort	*Senecio jacobaea*
Yellow star thistle	*Centaurea solstitialis*
Scotch broom	*Cytisus scoparius*
Puncturevine	*Tribulus terrestiris*
Canada thistle	*Cirsium arvense*
Leafy spurge	*Euphorbia esula*
Diffuse knapweed	*Centaurea diffusa*
Purple loosestrife	*Lythrum salicaria*

Avoid introducing or spreading noxious weed infestations in any areas. Reduce infestations where possible.

Land Use Allocations

None

Management Actions/Direction

Management Actions/Direction - Late-Successional Reserves

Evaluate impacts of nonnative plants (weeds) growing in late-successional reserves.

Develop plans and recommendations for eliminating or controlling nonnative plants (weeds) which adversely effect late-successional reserve objectives. Include an analysis of effects of implementing such programs on other species or habitats within late-successional reserves.

Management Actions/Direction - All Land Use Allocations

Continue to survey BLM-administered land for noxious weed infestations, report infestations to the Oregon Department of Agriculture (the department), and work with the department to reduce infestations.

Use control methods that do not retard or prevent attainment of aquatic conservation strategy and riparian reserve objectives.

Apply integrated pest management methods (e.g., chemical, mechanical, manual and/or biological) in accordance with BLM's multistate environmental impact statement, Northwest Area Noxious Weed Control Program, 1986, as supplemented in 1987, and the related ROD (see Appendix 1-C, Draft RMP).

Place priority on elimination or reduction of noxious weeds occurring within special areas.

Hazardous Materials

Objectives

Minimize use of hazardous materials and eliminate known hazardous waste on BLM-administered lands.

Land Use Allocations

None.

Management Actions/Direction

Identify, investigate, and arrange for removal of hazardous substances on BLM-administered land in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act. Emergency response will be as specified in the District Hazardous Materials Contingency Plan. The response will include cleanup, proper notifications, criminal investigations, risk assessment, and other actions consistent with the Act and the nature of the emergency.

Store, treat, and dispose of hazardous materials in accordance with the Resource Conservation and Recovery Act and other appropriate regulations.

Follow guidelines in the Emergency Planning and Community Right-To-Know Act to coordinate emergency planning with state and local jurisdictions concerning hazardous materials, emergency notifications, and routine reporting of hazardous materials inventories.

Remove and replace, if appropriate, all existing underground storage tanks with above ground storage facilities following state and federal regulations.

Until hazardous materials on BLM-administered land are removed, protect employees and the public from exposure to these materials.

Provide information to the public regarding the need to properly dispose of hazardous materials and the danger of becoming exposed to hazardous materials.

NOTE: This is the end of the Proposed Resource Management Plan. However, the following sections, located near the end of chapter 2, also apply to the PRMP and should be read to develop a complete understanding of this alternative: Coordination and Consultation, Use of the Completed Plan, Adaptive Management, Watershed Analysis, Requirements for Further Environmental Analysis, Management Assessments and Plans, Management of Newly Acquired Lands, Cost of Management, The Budget Link, Monitoring, and Research.

Management Direction Common to Alternatives NA-E

The following management direction applies to Alternatives NA-E, except for most of the No Action (NA) Alternative and portions of Alternative C. However, the Management Direction Common to Alternatives NA-E generally applies to the timber management portion for the NA Alternative.

General

Special management would be provided for the Pacific yew. The Pacific yew bark is the only currently approved source of taxol, a promising agent for treatment of a variety of cancers, including ovarian and breast cancer. The strategy for management and collection of Pacific yew bark on federal lands is the subject of a separate environmental impact statement (EIS) being prepared by the U.S. Forest Service with BLM as a cooperating agency. The PRMP/FEIS is scheduled to be published in late 1994. BLM actions covered by this PRMP would be consistent with the strategy under development. Pacific yew harvest on federal lands was the subject of a separate Pacific Yew EIS prepared in 1993 by the U.S. Forest Service with BLM as a cooperating agency.

While the goal of maintaining long-term soil productivity is inherent in all management practices, it is recognized that some minor losses in productivity could result due to surface disturbances (soil compaction, road construction, etc.) caused by management activities. Implementing BMPs and minimizing disturbance of fragile areas would keep losses to a minimum (see Appendix F).

All BLM-prescribed fire activities which could effect air quality would be conducted in accordance with the Oregon State Implementation Plan administered by the Department of Environmental Quality and the Oregon Smoke Management Plan administered by the Department of Forestry.

BLM would aid and support State of Oregon Economic Development Department's efforts to help isolated, small communities develop and implement alternative economic strategies as a partial substitute for their declining timber-based economies. Aid and support could include such things as coordination and prioritization of BLM recreation management and development activities, development of minor forest product programs, or other activities which would be mutually perceived by BLM and the involved communities as benefiting the identified economic strategies.

Water Quality and Riparian Zones

Water resources would be managed to protect, maintain, or improve the quality of water resources and watershed values associated with BLM-administered land, including surface and ground water quality and quantity and proper functioning condition of riparian-wetland areas. Protection of water quality, riparian areas, wetlands, and floodplains would be achieved through compliance with legal requirements.

Management activities would be consistent with Oregon's adopted statewide Water Quality Management Plan and comply with Oregon's Regulations Relating to Water Quality Control (Oregon Administrative Rules 340-41).

Management practices would be designed to comply with Oregon's Antidegradation Policy, which describes the conditions under which water quality may be lowered and when it must be maintained or enhanced. The purpose of the Antidegradation Policy, which includes policies on high quality waters, water quality limited waters, and outstanding resource waters, is to protect, maintain, and enhance existing surface water quality to protect all existing beneficial uses.

A nonpoint source management program would continue to be implemented in cooperation with the U.S. Environmental Protection Agency and the Oregon Department of Environmental Quality (DEQ) to assure protection of water and water-dependent resources. Oregon's nonpoint source management program requires BLM to implement best management practices (BMPs) which protect the beneficial uses of water. BMPs would be selected based on site-specific conditions, technical and economic feasibility, and the water quality regulations for waters potentially affected. BMPs designed to meet the BLM goals and objectives for soil and water resources are listed in Appendix 2-WA-1, Draft RMP. Timber harvesting, minerals management, recreation, off-highway vehicle (OHV) use, and other surface-disturbing activities would be managed to protect water quality.

The management goal in watersheds providing surface water used by public water systems serving municipalities would be to comply with the Clean Water Act.

Oregon Department of Environmental Quality (DEQ) has identified Bear Creek as water quality limited for biochemical oxygen demand and total phosphorus. BLM would coordinate with the Oregon Department of Forestry (ODF) in development of a Bear Creek nonpoint source water quality management program for forest management activities. This would include cooperation with ODF to implement a monitoring program that identifies phosphorus levels on forestland. Evans Creek and Little Butte Creek have also been identified by the DEQ as water quality limited streams.

Chemical uses by BLM, authorized contractors, and mining operators would provide for protection of both surface water and ground water. Examples of chemicals used would include, but are not limited to, herbicides, pesticides, fertilizers, fire retardant, solvents at maintenance shops, and fuels and chemicals used in mining operations. Herbicides would not be applied within 500 feet of any residence or other place of human occupancy without the occupant's consent or within 100 feet of any cropland.

Herbicides would not be applied by helicopter within 100 feet of any surface waters, by ground vehicles with boom sprayers within 25 feet of surface water, or by vehicle-mounted applicators or with backpacks within 10 feet of surface water.

Floodplains and wetlands would be protected in accordance with Executive Orders 11988 and 11990 to minimize the destruction, modification, loss or degradation of floodplains or wetlands including riparian areas. Protection for wetlands could include buffering, not entering, or other measures as needed based on site-specific conditions.

In accordance with the BLM Riparian-Wetlands Initiative for the 1990's, management would emphasize:

- protection of riparian-wetland areas and associated uplands,
- rehabilitation and maintenance of riparian-wetland areas, and
- partnership and cooperative rehabilitation and management of riparian-wetland areas.

Management activities in riparian areas on BLM-administered land would maintain or improve riparian conditions that support water-related functions (e.g., streambank stability, physical filtering of water, source of coarse woody debris to dissipate flood energy and create aquatic habitat, water storage, aquifer recharge, carrying and storing flood flows, and insulating streams from summer and winter temperature extremes). Average width of designated riparian management areas (RMAs) would vary by alternative (see Table 2-1 and Figure 2-1).

Actual RMA widths would be determined using the widths shown in Table 2-1 in conjunction with on-the-ground stream characteristics, riparian vegetation, soil, and topography.

No management activities would be planned within these RMAs. Some management activities could occur within the RMA to achieve resource management objectives such as stream/riparian enhancement, enhancement of fish and wildlife habitat, road construction, and yarding corridors to facilitate timber harvest outside the RMA. Prescribed fire and silvicultural activities could be used to meet RMA management objectives. Snags and down logs would be retained as identified in Chapter 2, Wildlife.

RMA widths on each side of perennial streams or those with fish (generally third order and larger streams) or adjacent to lakes, ponds, and other waters would extend a minimum of 50-feet horizontal distance from the high water mark on each side of the stream and an average distance that is wider varying by alternative.

Within 25 feet of first and second order intermittent streams without fish and where no RMA is planned, brush, hardwoods, Pacific yew, and nonmerchantable and noncommercial vegetation would be managed to maintain channel and streambank stability, minimize entry of sediment into stream channels, and minimize water quality degradation. Management activities to achieve resource management objectives such as stream/riparian enhancement, planting access, precommercial thinning, road construction, and yarding corridors would be permitted if designed to meet the stream/riparian objectives.

Analysis of cumulative effects by representative watershed would help guide overall timber sale scheduling during the life of the plan. See the discussion of Requirement for Further Environmental Analysis later in this chapter.

Four areas covering approximately 4,000 acres would be designated watershed monitoring areas and deferred from timber harvest and other management activities over the planning period. These watersheds, when paired with like watersheds where management activities would occur, would provide baseline information of the effects of management activities on water quality and quantity.

Timber

Timber management activities would be conducted in the forest landscape within a framework of land use allocations and silvicultural systems designed to meet management objectives over the entire lifespan of stands from regeneration to harvest. All silvicultural systems would be sustainable, economically practical, and capable of maintaining the long-term health and productivity of the forest ecosystem. Silvicultural systems are described in Appendix M; Appendix 2-T-2, Draft RMP, and summarized in Table 4-1.

Individual timber sales would be a result of activity planning at the level of drainages or individual timber sale areas. Any proposed harvesting would be based on silvicultural prescriptions which would show how land use objectives would be met for specific sites and stands utilizing available knowledge and technology. Each sale plan, along with an associated environmental assessment (EA), would address logging and transportation systems, site preparation and reforestation, as well as consistency with the approved resource management plan (RMP).

Silvicultural treatments would be analyzed through environmentals assessments (EAs) or categorical exclusions which would deal with site-specific effects and treatment issues.

Contracts, usually awarded on a competitive basis, are the means of accomplishing timber harvest and forest development practices. In contract preparation, selection of special provisions is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. The standard provisions of the basic timber sale contract, Bureau Form 5450-3, are applicable for all timber sales (see Appendix 2-T-3, Draft RMP, for an example of this form).

Allocations to Timber Management

Under each alternative lands would be managed to one of four allocations.

- intensive timber management,
- restricted timber management,
- managed for enhancement of other resources, or
- not available for timber management.

In each alternative, the probable sale quantity (PSQ) is based on planned timber harvest (usually from lands allocated to intensive or restricted forest management). Volume sold per year would be as evenly distributed as possible during the decade. Generally, salvage or other unplanned harvest would replace the planned sale volume.

Site Class V lands (179,725 acres) would be managed at a lower level of intensity because of economic considerations and uncertainty about the effect of intensive management on poor sites.

Intensive Timber Management Lands

Silvicultural systems for lands allocated to intensive timber management would be designed to meet a high level of timber production within a framework of mitigating measures and project design features which protect environmental quality, biological diversity, and wildlife habitat. This framework varies between the alternatives. Silvicultural systems under each alternative would have the following features.

- Genetically-selected planting stock would be utilized where available and in amounts consistent with the alternative design (see Appendix L).
- Growth enhancing practices such as commercial thinning and forest fertilization would receive site-specific environmental analysis.
- Practices that enhance timber quality, including pruning, would be used.

Restricted Timber Management Lands

Under this allocation, timber production would occur at lower levels than for intensive management lands in order to meet other resource objectives such as visual quality or fragile soils. Silvicultural systems would be designed to meet the requirements of nontimber resource allocations and objectives. Practices that would increase growth or timber quality would be consistent with restrictions.

Enhancement of Other Resources

Under this allocation, timber harvest would occur only as part of strategies to enhance other resources such as riparian habitat, wildlife habitat, or management of special areas. Harvest from these lands, when they occur, would generally not be included in the planned PSQ.

The following lists some of the reasons that timber harvest could occur on these lands.

- Provide more logical logging units or reduce road construction, thereby reducing overall cumulative effects.
- Salvage timber killed or substantially damaged by fire, wind throw, insect infestation, or other catastrophe. Such harvest would be accomplished under special silvicultural prescriptions designed to meet the needs of non-timber allocations made on these lands.
- Provide for the safety of forest users (including removing hazard trees along roads and trails, in camp grounds and administrative sites, etc.).
- Facilitate construction, operation, and maintenance of new facilities such as roads, trails, power lines, communication facilities, recreation or administrative facilities, etc.
- Scientific or research studies.
- Isolate and release Douglas-fir and sugar pine test trees.
- Maintain or enhance fish and wildlife habitats.
- Facilitate development of mines, quarries, or fluid mineral leases.
- Modify high fuel hazard areas by construction of shaded fuel breaks and/or increase defensible space for fire suppression by maintenance of early seral stage conditions. Such activity could occur to provide protection for timber production areas, old growth blocks, or developed recreational facilities.

Not Available for Timber Management

Under this allocation, timber harvest would not occur to meet any resource objective. Under all alternatives, the wild section of the Rogue National Wild and Scenic River corridor, the Wild Rogue Wilderness, and the Soda Mountain Wilderness Study Area (WSA) (under interim management or if designated wilderness) would not be available for timber harvest.

Management of Intensive and Restricted Timber Management Lands

Lands allocated to intensive or restricted timber management would be managed for timber production consistent with the assumptions and concepts guiding the formulation of each plan alternative. Details of the PSQ calculation process are shown in Appendix 2-T-5, Draft RMP. Details of silvicultural systems and silvicultural treatments for these lands are in Appendix 2-T-1, Draft RMP. Table 4-1 summarizes these systems.

Water quality and site productivity: Best management practices (BMPs) for soil and water resources (see Appendix 2-WA-1, Draft RMP) would be used in designing site-specific silvicultural prescriptions consistent with the objectives of each plan alternative.

Salvage of mortality: Salvage of partial or entire stand mortality would occur where consistent with land use allocations, as well as snag and down wood retention objectives for soils and wildlife (see Wildlife).

Species and stocking levels: The density and species mixture of commercial forest stands would be consistent with the design and theme of each alternative. Both precommercial and commercial thinnings would be scheduled to achieve desired levels of timber production, to maintain stand vigor, and to achieve desired stand characteristics.

Reforestation practices: All stands subject to regeneration harvest would be promptly reforested using seeding, planting, or natural reforestation techniques.

Practices based on stand and site conditions: Harvesting regimes and other silvicultural practices would be based on alternative design objectives but would be adapted to meet the specific conditions of individual stands and physical sites. Stand vigor, aspect, soils, topographic position, landscape constraints, species composition, and forest disease condition would be considered.

Site preparation and stand establishment: Site preparation, stand maintenance, stand protection, and release practices including biological methods, prescribed burning, chemical treatments, and mechanical or manual treatments would be utilized as required to meet plan objectives and be consistent with decisions in the Vegetation Management Record of Decision (ROD) (see Appendix 1-D, Draft RMP).

Actions would emphasize the use of preventative or ecosystem-based strategies within an integrated approach which considers all available tools, natural ecological processes, human health, economics, fire hazard, environmental quality, and the maintenance of site productivity. Site preparation treatments would occur promptly after yarding to assure timely reforestation.

Ecosystem health: Forest practices would be designed to retain long-term site productivity, promote ecosystem health, and assure the sustainability of timber production. Consistent with the design of each alternative, individual timber sale and silvicultural actions would contain design features which prevent site degradation and which protect the forest from increased levels of damage from pathogens and insects. Management plans would be developed to treat specific tree diseases and insect outbreaks as necessary. A management plan would be prepared with the goal of preventing the spread of Port-Orford cedar root disease.

Utilization standards: Sale of forest products would be designed to encourage full utilization of harvested timber while reserving structural components (such as snags and coarse woody debris) consistent with objectives for wildlife habitat management, old growth management, biological diversity, and site productivity.

Logging systems: Harvesting methods and yarding systems would be selected based on suitability for the successful implementation of silvicultural systems, operational and economic practicality, and protection of site productivity and water quality.

Special forest products: Sale of special forest products (firewood, burls, mushrooms, ferns, floral greens, etc.) would be consistent with other land use allocations. Sales would ensure resource sustainability and protection of other resource values such as special status plants or animals species. The market value of such products would be based on their highest and best use.

Special Status (Including Threatened and Endangered) Species Habitat

Special status species include species which are federally listed, federally proposed, federal candidate, state listed, Bureau-sensitive, and assessment species.

Habitats of federally listed or proposed threatened or endangered species would be protected, monitored, and managed as required by law. The alternatives incorporate required levels of protection of listed or proposed species only where critical habitat had been designated or a recovery plan was in effect before the alternatives were formulated. For example, some alternatives provide no specific allocations to lands for protection of northern spotted owls, although most alternatives (B and C) include allocations that provide some protection for northern spotted owl sites.

Prior to any vegetative manipulation, surface-disturbing activity, or any disposal of BLM-administered land, a review of the affected site or areas would be conducted for special status plants and animals species. If a project affects any federally threatened or endangered species or candidate species or its critical habitat, efforts would be made to modify, relocate, or abandon the project to avoid adversely effecting the species or its habitat. In situations where BLM determines that such a project cannot be altered to eliminate the potential effect and abandonment of the project is not considered appropriate, consultation with the U.S. Fish and Wildlife Service would be initiated.

All actions would be consistent with the Pacific Bald Eagle Recovery Plan and the Peregrine Falcon Recovery Plan. Known habitat sites and potential sites identified in the recovery or implementation plans would be protected.

As funding permits, systematic inventories, studies, and monitoring would be conducted on special status species where baseline information is currently lacking. Also, habitat management plans (HMPs) would be prepared for federal candidates, state listed, and Bureau-sensitive species to help prevent future listing as needed.

Bald Eagle (Federal Threatened Species)

Within one-half mile of active bald eagle sites there would be no aerial use of herbicides or pesticides and human disturbance would be minimized between February 1 and August 15. The areas would be managed to retain requisite forest habitat characteristics including large trees, snags, and at least 50 percent canopy closure. These sites would be designated fire fuels management areas to reduce fuel loadings. All BLM-administered land would be retained in federal ownership. An HMP would be prepared to provide more specific management guidelines for bald eagles.

The core area around known bald eagle nest sites (approximately 10 to 70 acres) would be protected. In addition to the measures used in the one-half mile radius within the protected core area, there would be no planned timber harvest except to benefit bald eagle nest habitat, no new road construction, and no surface occupancy (NSO) for leasable minerals. Core areas would be designated fire fuel management areas to prevent future loss due to wildfire. They would also be high priority fire suppression areas, however, suppression activities would be limited to maintain old growth characteristics and minimize disturbance during nesting season.

Two additional 80-acre areas would be retained with suitable nesting characteristics for future territory establishment consistent with the Pacific Bald Eagle Recovery Plan. One of these would be located along the wild section of the Rogue River in the vicinity of Whiskey Creek and the other would be in the Finley Bend area along the recreational section of the Rogue River. These areas would be designated fire fuels management areas to prevent future loss to wildfire, and these lands would be retained in federal ownership.

Peregrine Falcon (Federal Endangered Species)

Within one mile of active peregrine falcon nest sites, human disturbances with the potential to disturb the nest would be minimized and roads (except major arterial roads) would be closed between February 1 and August 15. The areas would be managed to retain diversity of habitats for prey species. They would be designated fire fuels management areas to reduce fuel loadings and manage habitat conditions. As opportunities exist, forage for prey species could be enhanced through plantings of mast and berry producing shrubs. All BLM-administered land would be retained in federal ownership. A habitat management plan would be prepared to provide more specific management guidelines for peregrine falcons.

The core area within one-half mile of active peregrine nest sites would receive additional protection. In addition to the measures used in the one-mile radius within the protected core area, there would be no scheduled timber harvest, no aerial application of herbicides or pesticides, and no surface occupancy (NSO) for leasable minerals. There would be no new road construction unless the activity would not adversely effect the integrity of the site. These areas would be designated priority fire suppression areas.

Northern Spotted Owl (Federal Threatened Species)

There would be no tree falling within one-quarter mile of all active northern spotted owl nest sites from approximately March 1 to September 30 to avoid disturbance and harm to young owls.

Marbled Murrelet (Federal Threatened Species)

Inventories and monitoring for this species would be instituted in the Grants Pass and Glendale resource areas, the only suspected habitat within the planning area.

Any nest locations would be protected and human disturbance would be minimized between approximately March 1 and July 15.

Wildlife (Including Fisheries) Habitat

Wildlife

On lands not allocated to timber management, the following would apply:

- Coarse woody debris would be retained to approximate the mean amounts found in each successional stage of unentered stands (see Table 2-2).
- Snags, live cull trees, and green merchantable trees would be retained to provide nest sites for 100 percent of optimum cavity excavator populations both for present needs and for sustainability over the long-term. This level generally corresponds to approximately 300 snags per 100 acres of forested habitat.

On lands allocated to timber management, the following would apply:

- All unmerchantable snags and culls would be retained unless they pose a safety hazard.
- New roads would avoid areas of special habitats with high wildlife values and would be located to avoid or minimize effects to wetlands and riparian areas where practical.
- Nesting platforms, nest boxes, and other structures would be erected to enhance habitat for

osprey, other raptors, waterfowl, and other species as opportunities become available.

- Special habitats such as caves, meadows, and wetlands would be managed to protect or enhance their values as wildlife habitat. This may include maintaining or restoring adjacent forest to avoid changing airflow patterns which may result in drier or warmer micro-habitats, preventing vehicle or recreational access to reduce disturbance, or other methods. All meadows and wetlands would be closed to off-highway vehicle (OHV) use. For cliffs and talus areas, see Management Direction Common to All Alternatives, Special Status (Including Threatened and Endangered) Species Habitat.

Habitat management plans (HMPs) or coordinated resource management plans (CRMPs) would be developed for the big game management areas (see Map 2-11).

Fisheries

Consistent with BLM's Nationwide Fish and Wildlife 2000 Plan, the fisheries potential of anadromous fish streams would be enhanced. To the extent of available funding, all uncompleted fish habitat improvement projects identified in BLM's, "A Five-Year Comprehensive Anadromous Fish Habitat Enhancement Plan for Oregon Coastal Rivers, 1985," would be completed. In addition, a number of other projects have been identified where potential limiting factors exist and their proposed correction could be accomplished in a cost-effective manner to alleviate natural limiting factors or to correct problems caused by past management activities. Table 2-3 shows both the remaining projects in the Five-Year Plan and other identified projects in priority order. If other projects are identified, they would be evaluated and completed as they fit the overall priorities addressed above. Projects would be implemented only when they are compatible with Oregon Department of Fish and Wildlife (ODFW) wild fish management policy. Opportunities not identified in Table 2-3 could be implemented depending on priority and funding. Rehabilitation efforts could also focus on streams that have been devastated by natural catastrophic events.

To protect investments in fish improvement projects, mineral withdrawal would be pursued for the affected stream reach.

In fish producing streams, screening facilities would be required on intakes when granting rights-of-way or easements for water diversions (pipelines and ditches) across public land. Facility design would meet or exceed ODFW standards.

Special Areas

Designated areas of critical environmental concern (ACEC), research natural areas (RNAs), and environmental education areas (EEAs) would be managed to maintain and enhance their significant resource values for the designated area. Site-specific management plans would be developed for new and modified special areas as needed. Existing ACECs and EEAs selected for continued management would generally be managed in accordance with existing management plans. The management plans would address specific objectives and activities such as land acquisition, the role of fire, and interpretation. Interim management would continue to protect the resource values until the management plans are in place (see Table 3-SA-2).

There would be no surface occupancy (NSO) for leasable minerals in ACECs. Mining in ACECs would be allowed only in a manner that would not impair or degrade the significant resource values for which the area was designated. A plan of operation would be required for all mining activity. Withdrawals from mineral entry would be pursued for all RNAs and Table Rocks ACEC. No quarry development would be allowed in special areas. No timber harvesting, road construction, operation of ground-based fire suppression equipment, or other surface-disturbing activities would be allowed within RNAs. Off-highway vehicle (OHV) use would be limited to designated roads in all ACECs. All RNAs would be closed to OHV use. All designated RNAs would be managed to maintain the natural systems and the aquatic and terrestrial cells identified in the Oregon Natural Heritage Plan for which they were identified.

Two candidate ACECs (Section Six and Slide Creek) were dropped from ACEC consideration through interdisciplinary team analysis because they did not meet BLM eligibility criteria. These areas would be managed in a variety of ways depending on the alternative selected as shown in Appendix I.

Land acquisitions through exchange, purchase, or donation would be pursued where it would block up ownership, gain access, or enhance the special area.

Specific opportunities and needs would be addressed in site-specific management plans.

Recreation

Most BLM-administered land in the planning area would be managed for a variety of recreation opportunities (i.e., hunting, fishing, sightseeing, riding, hiking, rafting, recreational gold panning, etc.) consistent with other resource management objectives. Provision of recreational opportunities in or adjacent to water would be emphasized.

All existing recreation facilities (11) and trails (14) would be maintained and managed, some in partnership with other agencies or groups. The provision of recreation opportunities would vary by alternative as shown on Table 2-4.

Seventy-two miles of BLM/county road would continue to be designated as National Back Country Byways. Additionally, 56 miles of state highways 62 and 234 within the planning area are designated as the Rogue-Umpqua National Scenic Byway.

Emphasis would be placed to provide interpretive and informational signs and maps to support state and local tourism strategies. Emphasis would also be placed on accomplishing the goals and objectives of BLM's Recreation 2000 Implementation Plan and the Oregon-Washington special recreation management area and extensive recreation management area initiatives.

The congressionally-designated Wild Rogue Wilderness, Pacific Crest National Scenic Trail, and the Rogue National Wild and Scenic River would be managed to preserve their remarkably outstanding natural resource values and the desired recreational opportunity settings in accordance with applicable legislative mandates.

Cave management plans would be prepared for significant caves with the objectives of identifying resource values, public hazards, and development conflicts.

Recreation facilities would be designed and constructed to minimize effects to other resource values such as riparian management areas (RMAs), research natural areas (RNAs), and old growth areas where protected by various alternatives.

Timber harvesting within developed recreation sites, recreation and public purposes (R&PP) leases, and withdrawn recreational lands of other federal agencies (Bureau of Reclamation (BOR) and Army Corps of Engineers (ACOE) would be limited to dead, dying, or hazard trees or to provide desired regeneration of the forest canopy.

Mineral withdrawals would be pursued for all existing developed recreation sites and for proposed recreation sites when development is initiated.

Acquisition of private lands within congressionally-designated areas would be continued to enhance management and development of recreation opportunities.

The objectives of off-highway vehicle (OHV) management on BLM-administered land are to provide for public needs, protect natural resources and the safety of the public land users, and minimize conflicts among various users. BLM-administered land would be designated as open, closed, or limited to OHV use in accordance with Executive Orders 11644 and 11989 and regulations contained in 43 CFR 8340.

Existing OHV closures within the congressionally-designated Wild Rogue Wilderness, Rogue National Wild and Scenic River, and the Pacific Crest National Trail, except for roads crossing the Pacific Crest Trail, would continue in order to protect their outstandingly remarkable recreational resource values and to meet legislative mandates.

Under all alternatives, OHV use in existing recreation sites would be limited to existing roads, the Soda Mountain wilderness study area (WSA) would be limited to existing roads and trails, the Wild Rogue Wilderness would be closed to OHV use, and the Brewer Spruce Instant Study Area (ISA) (which is an existing RNA) would be closed to OHV use.

Developed recreation sites would be designated as intensive suppression areas and as fire fuels management areas to reduce fire hazards and protect investments. The congressionally-designated Wild Rogue Wilderness and Rogue National Wild and Scenic River would be identified as lands having equipment restrictions to fire suppression activities.

Recreation resources and management opportunities within the Rogue National Wild and Scenic River corridor will not be readdressed in this planning document. Separate recreation area management plans (RAMPs) and environmental assessments (EAs) are in progress.

Wild and Scenic Rivers

BLM uses a three-step wild and scenic rivers study process: the first step is to determine eligibility; the second step is to determine potential classification (both were completed in early 1990); and the third step is to determine suitability which is done through this planning process. Final decisions concerning designation of Wild and Scenic Rivers is reserved by Congress.

Files used to document eligibility and potential classification are maintained in the Medford District Office. Wild and scenic rivers eligibility and classification criteria are shown in Appendix 2-WS-1, Draft RMP. Suitability findings for Alternatives A-E were directed by the State Director Guidance (see Appendix D).

The corridor width for all rivers found eligible or studied for suitability is defined as one-quarter mile on either side of the river (one-half mile wide corridor). Interim protective management of BLM-administered land within the one-half mile corridor would be provided to protect outstandingly remarkable values (ORVs) for all streams found eligible until the Record of Decision (ROD) is signed and approved. Interim protective management would be provided to all streams found eligible but not studied by BLM in this RMP (generally, those segments where BLM administers less than 40 percent of the land base within the one-half mile corridor) and all streams studied and found suitable until Congress acts on study recommendations. Interim protective management would cease for all streams studied and not found suitable when the ROD is signed and approved.

Under interim protective management, no actions would be authorized on BLM-administered land within the one-half mile corridor that would adversely effect ORVs which resulted in rivers being found eligible/ suitable. Management guidelines and standards for designated National Wild and Scenic Rivers would also be applied to segments under interim management and are described in Appendix 2-WS-2, Draft RMP.

Interim protective management for potential recreational rivers would exclude timber harvest in the riparian management area, severely restrict development of leasable and saleable minerals, and protect the segments' free flowing values and identified ORVs. Interim protective management for potential scenic rivers would exclude timber harvest in the streamside zone (the designated riparian management area which varies by alternative), provide VRM Class II management in the one-half mile corridor, and protect the segments' free flowing values and identified ORVs. Interim protective management for potential wild rivers would exclude timber harvest and other disturbing activities within the one-half mile corridor. Exploration and development of locatable minerals would be restricted but not prohibited on all rivers found eligible for any classification.

Visual Resources

Visual resources would be managed to meet visual quality objectives outlined in the following visual resource management (VRM) classes. The designation of lands relating to VRM classes would vary by alternative as shown in Table S-1.

Class I. The objective of this class is to preserve the existing character of the landscape. This class provides for natural ecological changes, however, it does not preclude limited management activity. The level of change to the characteristic landscape should be very low and must not attract attention.

Class II. The objective of this class is to retain the existing character of the landscape. The level of change to the characteristic landscape should be low. Management activities may be seen but should not attract the attention of the casual observer. Any changes must repeat the basic elements of form, line, color, and texture found in the predominant natural features of the characteristic landscape.

Class III. The objective of this class is to partially retain the existing character of the landscape. The level of change to the characteristic landscape should be moderate. Management activities may attract attention but should not dominate the view of the casual observer. Changes should repeat the basic elements found in the predominant natural features of the characteristic landscape.

Class IV. The objective of this class is to provide for management activities which require major modification of the existing character of the landscape. The level of change to the characteristic landscape should be high. Management activities may dominate the view and be the major focus of viewer attention. However, every attempt should be made to minimize the effect of these activities through careful location, minimal disturbance, and repeating the basic elements of form, line, color, and texture.

The visual resource contrast rating system would be used during activity level planning to determine what and how proposed activities would meet VRM objectives. The following timber harvest scenarios could be used to meet VRM Class II and III objectives. Based on the visual resources rating system and site-specific conditions, these scenarios or others could be used.

Timber management silvicultural prescriptions that could meet VRM Class II objectives employ single tree selection, uneven-aged harvest, retention of shelterwood overstory trees, or small clearcuts which approximate group selection harvest in seen areas. Shelterwood retention harvest would usually involve leaving 80 to 120 square feet of basal area per acre and not completing overstory removal until the understory meets visual standards, which usually occurs at about age 40. Clearcut harvest systems would limit harvest units to 3 to 5 acres of seen area and 6.6 percent of timber lands within the viewshed (considering all ownerships) per decade to achieve appropriate distribution of harvest modifications and to retain the natural character of the area.

Timber management silvicultural prescriptions which could meet VRM Class III objectives employ either short-term retention of shelterwood overstory trees, or use clearcuts which have less than 10 acres of observable disturbance and which do not disturb more than 10 percent of timber lands within the viewshed (considering all ownerships) per decade to achieve appropriate distribution of harvest modifications, and to partially retain the natural character of the area.

No specific timber management constraints would apply to lands managed for VRM Class IV objectives. However, mitigation of visual effects would be incorporated where consistent with efficient timber harvest or other management activities.

The congressionally-designated Wild Rogue Wilderness and Rogue Wild and Scenic River corridor would be managed to maintain or enhance their scenic values under VRM Class I management objectives. See Table S-1 for acres of each VRM class by alternative.

Cultural Resources

BLM would continue to identify localities with cultural resource values and manage them for their public and scientific uses. This objective would largely be accomplished through implementation of regulations found in 36 CFR 800 which ensures that federally authorized land use actions do not inadvertently harm or destroy federal or nonfederal cultural resources. These regulations also include affirmative measures taken to protect and enhance cultural resources. The affirmative measures would largely be a result of the 1988 Archeological Resources Protection Act (ARPA) amendments and the Bureau initiative, "Adventures in the Past." The ARPA amendments direct federal agencies to inventory and evaluate their cultural resources and to develop public awareness programs to explain the significance of those resources. "Adventures in the Past" would help attain those goals by enhancing public enjoyment and awareness of the resources.

Implementation of actions to enhance data collection, preservation of important sites, and development of public awareness programs could include the following. These would be subject to change based on the accumulation of new data and available funding.

- Systematic inventory of areas likely to contain cultural resources.
- Systematic testing and evaluation of archeological sites to assess their potential for contributing to public and scientific uses.
- Development of cultural resource management plans for areas with fragile resources or a record of intensive prehistoric or historic use. These areas would include the archeological and historical sites within the Rogue River corridor as well as other areas within the district.
- Development of long-term inventory strategy plans based on geomorphic provinces of the Coast Range, western Cascades, and Klamath Mountains. These plans would update previous overview work and provide the necessary context for locating and evaluating cultural resources within the geomorphic areas. These plans would include consideration of past and present environmental factors pertinent to human use of the area, review of the ethnographic record and current interests of concerned American Indian groups, review of the historic and prehistoric record in order to predict areas of sensitivity, and to establish the research context for evaluating extant cultural resources. The plans would develop appropriate inventory strategies for initial and post-project survey efforts. Ongoing inventory work would contribute to the modification of these inventory strategy plans.

- Develop memoranda of understanding (MOU) with recognized Indian groups so their heritage and religious concerns may be appropriately considered. These groups would include the Cow Creek band of Umpqua Tribe Indians.

- Systematic monitoring by law enforcement personnel of cultural resources being affected by unauthorized use and implementation of appropriate measures to protect the vandalized sites. Such measures could necessitate site evaluation and data recovery programs where other protective measures are not adequate or feasible.

- As part of the "Adventures in the Past" initiative, interpretation of cultural resources to increase public awareness and appreciation of the resource values would be undertaken.

- Implementation of physical protection measures such as riprapping and barrier installations reduce deterioration of cultural sites.

- Historical or archaeological sites threatened by the accumulation of fire fuels would be identified as fire fuels management areas and as intensive suppression areas.

Wilderness

One designated wilderness area (Wild Rogue Wilderness), one wilderness study area (Soda Mountain WSA), and one instant study area (Brewer Spruce ISA) are located within the planning area. Management of these areas is described below.

The Wild Rogue Wilderness, located in the northwest part of the planning area, was established by the Endangered American Wilderness Act of 1978 (Public Law 95-237). The Wild Rogue Wilderness includes lands administered by both the Bureau of Land Management and the U.S. Forest Service. This entire wilderness area including approximately 8,971 acres of BLM-administered lands, is managed by the Forest Service. Management guidelines are established in the Land and Resource Management Plan, Siskiyou National Forest, 1989. The allocation of BLM land consistent with the congressional designation would not be changed by any of the alternatives.

Management of the Soda Mountain WSA and the Brewer Spruce ISA would comply with the Bureau's Wilderness Interim Management Policy until Congress acts to designate or not designate these areas as wilderness. Pursuant to interim management, no action would be authorized that would diminish the suitability of the lands for wilderness. The alternatives address options for management of these areas if Congress decides not to designate them as wilderness. Oregon BLM has previously recommended that Soda Mountain WSA (5,867 acres) be designated as wilderness and the Brewer Spruce ISA (429 acres) not be designated as wilderness.

Land Tenure Adjustments

Land tenure adjustments are made through both acquisitions and disposals. Acquisitions may occur by land purchase, donation, exchange, or transfer of jurisdiction from another federal agency. Disposals occur by sale, exchange, transfer of jurisdiction to another federal agency, and by infrequent sales or transfers under legal authorities such as the Color-of-Title Act, the Recreation and Public Purposes Act, and specific special acts of Congress.

Exchanges would be made to enhance public resource values and/or improve land patterns and management capabilities of both private and BLM-administered land within the planning area by consolidating ownership and reducing the potential for land use conflict.

All land tenure adjustments would consider the effect on the mineral estate. If the lands are not known to have mineral potential, the mineral interest would normally be transferred simultaneously with the surface.

The land ownership adjustment criteria identified in Appendix P would be considered in environmental assessments (EAs) prepared for specific adjustment proposals.

Transfer of BLM-administered land to other federal agencies would be considered where consistent with public land management policy and where improved management efficiency would result. Minor adjustments involving sales or exchanges may be made based on site-specific application of the land ownership adjustment criteria.

Land to be acquired by BLM through exchanges generally requires that one of the following exist:

- facilitate access to public land and resources,

- maintain or enhance important public values and uses,

- maintain or enhance local social and economic values in public ownership, or

- facilitate implementation of other aspects of the approved RMP.

Land tenure adjustments would be guided by a three zone concept utilizing the following standards.

Zone 1. Includes areas currently having high public resource values which merit long-term public ownership under BLM administration.

Zone 2. Includes lands that meet criteria for exchange because they form discontinuous ownership patterns, are less efficient to manage, and may not be accessible to the general public. These BLM-administered lands may be blocked up in exchange for other lands in Zones 1 or 2, transferred to other public agencies, or given some form of cooperative management. These lands would not be sold under federal Land Policy and Management Act (FLPMA) of 1976, Section 203(a).

Zone 3. Includes lands that are scattered and isolated with low resource values. These lands would be available for exchange to acquire lands in zones 1 or 2. They meet the requirements for disposal through sale in FLPMA, Section 203(a), if no viable exchange proposals can be identified. These lands would also be available for transfer to another federal agency or state or local governments, as needed, to accommodate community expansion or other public purposes. Zone 3 lands include both public domain (PD) lands and Oregon and California (O&C) lands that are not suitable commercial forestland.

Lands in the three zones would be the same in all alternatives as shown on Map 2-2 and Table S-1. Zone 3 lands are identified in Appendix Q.

Sale of BLM-administered lands are conducted under the authority of the FLPMA of 1976, Section 203, which requires one of the following conditions exist before land is offered for sale.

- Such tract, because of its location or other characteristics is difficult or uneconomical to manage as part of BLM-administered land and is not suitable for management by another federal department or agency; or

- Such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose; or

- Disposal of such tract will serve important public objectives including, but not limited to, expansion of communities and economic development which cannot be achieved prudently or feasibly on land other than BLM-administered land and which outweigh other public objectives and values including but not limited to, recreation and scenic values which would be served by maintaining such tract in federal ownership.

BLM-administered land within the exterior boundary of the Rogue River National Forest would be transferred to the National Forest. National forestland intermingled with BLM-administered land would be transferred to BLM.

The Coos Bay-Medford District and South Coast-Josephine sustained yield unit (SYU) boundaries would be adjusted to include Coos Bay District land currently managed by the Medford District within the Medford District. These lands are located in the O'Brien-Takilma area.

The homesite leasing program at Hyatt Lake would continue as currently managed.

Rights-of-Way

BLM-administered lands would continue to be available for needed rights-of-way where consistent with local comprehensive plans and Oregon statewide planning goals and rules. Applications outside of exclusion areas would be considered on a case-by-case basis. Approvals of any right-of-way would consider the protection of public safety, be consistent with the RMP, and provide for minimizing damage to the environment. Each right-of-way would be limited to the area necessary for operation and maintenance.

Utility/transportation routes (for electric transmission, as distinguished from distribution facilities; pipelines 10" in diameter or larger; important canals, ditches, and conduits; railroads; communication lines for interstate use; federal and state highways and major county roads) would be confined to existing utility/transportation routes and other previously designated corridors as shown on Map 3-1. Communications facilities would be allowed on existing communication sites, also shown on Map 3-1. Communication facilities on sites other than those shown on Map 3-1 would be considered on a case-by-case basis. Applications may be approved where the applicant can demonstrate that use of a designated communication site is not technically feasible and where the proposed facility would otherwise be consistent with the RMP and provide for minimizing damage to the environment.

Corridor widths vary depending on the number of parallel facilities but are a minimum of 2,000 feet (1,000 feet either side of existing centerlines) unless constrained by exclusion areas described below. Applicants would be encouraged to locate new facilities (including communication sites) adjacent to existing facilities to the extent technically and economically feasible.

Rights-of-way for hydroelectric development would be consistent with the Northwest Power Planning Council, which recommends prohibiting future hydroelectric development on certain rivers and streams with important fisheries and wildlife values.

All research natural areas (RNAs), VRM Class I areas, rivers suitable for wild status, the wild section of the Rogue River, and the wilderness study areas would be considered right-of-way exclusion areas (where future rights-of-way may be granted only when mandated by law).

All existing and proposed recreation sites, ACECs (other than RNAs), rivers suitable for scenic or recreational status, wetlands and riparian areas, areas identified as having threatened or endangered, proposed, candidate (Category 1 or 2), state listed or Bureau-sensitive plant or animal species, and VRM Class II areas would be rights-of-way avoidance areas (where future rights-of-way may be granted only when no feasible alternative route or designated right-of-way corridor is available).

Access

BLM acquires access to public lands by purchasing road easements and entering into reciprocal right-of-way agreements.

Easements for administrative and public use and timber harvest purposes would be acquired where needed to support a variety of resource management programs such as recreation, wildlife, etc. An attempt would be made to negotiate public access rights where long-term easements are obtained. Condemnation for access may be pursued where negotiations fail.

The attempt to negotiate public access rights in conjunction with existing reciprocal right-of-way agreements would be made when the opportunities arise. Public access on major travel routes would be acquired where feasible. New reciprocal right-of-way agreements would identify conditions that meet current management objectives.

Withdrawal Review

Table 2-5 shows existing land classifications and withdrawals which would be recommended for retention and revocation; these lands would be managed as discussed under each alternative. This table also shows existing land classifications and withdrawals that are still under review.

Roads

Roads would be located, designed, constructed, maintained, and managed to standards that meet road management objectives in accordance with the District Road Management Handbook. Best management practices (BMPs) for water quality and soil productivity would be followed to reduce or mitigate adverse effects (see Appendix 2-WA-1, Draft RMP).

Maintenance levels on each road would be set to meet resource management objectives and listed on the annual District Maintenance Operations Plan. New road standards would be determined during the timber sale or project planning process. Roadside brushing would be properly timed to prevent further spread of blackstain fungus.

A road management plan would be developed which specifically addresses recreational use, open road densities, road closures, water quality, construction and maintenance standards, fire suppression, and coordination with adjacent land owners.

The road management plan would specifically address stabilizing existing roads located on fragile granitic, schist, and pyroclastic soils such as those located in the West Evans Creek and the Upper Lake Creek drainages of Jackson County.

Travel and recreation management would be enhanced through increased emphasis on interpretive and informational signs and maps that would support state and local strategies for encouraging tourism. All major travel routes, including the back country byways (BCBWs) within the planning area would be adequately identified on informational handouts and at locations in the field. A districtwide travel map would be prepared for public distribution.

A road system management goal would be to reduce districtwide road density through an active program of road closures and rehabilitation. Specific road closures would be determined using standard analysis, public involvement, and notification procedures.

Minor collector and local roads would be closed or blocked to lessen soil erosion, maintenance requirements, effects on wildlife, and to improve water quality. Most unsurfaced roads would be closed except where open road effects would be minimal. Roads would be blocked with gates or other temporary barriers when needed for administrative use including timber management, preexisting rights-of-way, or access for mineral exploration and development.

Under the various alternatives, specific management direction for roads is discussed under each resource section.

Energy and Minerals

The objective of the minerals management program is to maintain and enhance opportunities for minerals exploration and development to be consistent with environmental protection. Under all alternatives, most of the planning area would remain open to exploration and development of minerals except where closed by executive order, Congressional Acts, or Secretary of the Interior discretionary closure. Existing withdrawals that would be continued include the Rogue Wild and Scenic River.

Leasable Minerals

Standard oil and gas lease stipulations are listed in Section 6 of "Offer to Lease and Lease for Oil and Gas" Form 3100-1 (see Appendix 2-EM-1, Draft RMP).

Special stipulations would be attached to oil and gas leases to provide additional protection for fragile areas or crucial resource values. A seasonal restriction could be used to protect critical wildlife habitat or prevent excessive erosion, etc. A controlled-use stipulation could be used to protect valuable resources in very small areas. A no surface occupancy (NSO) stipulation could be used to protect valuable resources spread over a large area while still providing an opportunity for exploration and development.

Special stipulations for leasable minerals are shown in Appendix M. The special stipulations regarding seasonal restrictions, controlled surface use, and prohibiting surface occupancy could be waived by authorized BLM officials if the objective of the stipulation would be met in another manner or if the resource being protected was no longer present.

Examples of special stipulations include:

- leasing designated special areas with a NSO restriction,
- leasing in big game winter range with a seasonal restriction, and
- leasing of meadows or wetlands with a controlled surface-use restriction.

Tables 2-6 and 2-7 illustrate the federal mineral estate in the planning area on which oil and gas and geothermal activities, respectively, would be restricted by alternative.

Locatable Minerals

Areas not specifically withdrawn from mineral entry would continue to be open under the mining laws. Mineral exploration and development would be regulated under 43 CFR 3802 and 3809 to prevent "unnecessary or undue degradation."

All surface disturbance from operations, whether conducted under a notice or plan of operations, would be reclaimed at the earliest feasible time.

The standards that govern activities conducted under a notice of operations (affecting five acres or less) and those that govern activities under a plan of operations (affecting more than five acres) are also shown in Appendix N.

Restriction on mining activity would vary by alternative as shown on Table 2-8 and in Appendix N.

Additional guidelines governing mining activities are discussed below.

- All instream placer mining would be closed to suction dredging for the time specified in Oregon Guidelines for Timing of In-Water Work to protect fish and wildlife resources. Waivers could be granted by Oregon Department of Fish and Wildlife.
- Mining operations within riparian management areas (RMAs) and along other streams with beneficial uses would be subject to mitigation

measures whether conducted under a notice or a plan of operations. Mitigating measures would be developed to prevent degradation of water quality including siltation and water temperature and to comply with Executive Order 11190 (Protection of Wetlands). Road construction, clearing vegetation, hazard tree removal, mining waste disposal, and other surface-disturbing activities that would degrade water quality or riparian/wetland habitat would either be prohibited or require special mitigation. These activities within RMAs would be considered unnecessary or undue degradation unless acceptable mitigation measures are approved in advance. Mining activities would conform to best management practices (BMPs) to protect water quality (see Appendix 2-WA-1, Draft RMP).

- Mining operations would be allowed in designated ACECs but only in a manner that would not impair or degrade those significant resource values which lead to area of critical environmental concern (ACEC) designation. A plan of operations would be required in all designated ACECs. A plan of operations would not be approved if operations would irreparably damage those resource values for which the ACEC was designated.

- Mining operations would not be allowed to disturb lands classified fragile nonsuitable woodlands under the timber production capability classification (TPCC) unless adequate mitigation measures are implemented to prevent slope failures, damage to soil productivity, or erosion.

- Mining operations in lands classified VRM Class II would maintain the existing visual characteristics of the landscape. Evidence of exploration and development activities would be reclaimed to meet VRM Class II management objectives. All disturbed lands would be graded to near natural contours where practical and revegetated with native plants.

- All mining activity employing suction dredges would comply with Oregon State Department of Environmental Quality permit No. 0700.

- All mining activities discharging waste water would comply with Oregon State Department of Environmental Quality Permit No. 0600.

A number of areas/sites have been proposed to be withdrawn from mineral entry under the mining laws. These areas/sites would also be closed to disposal of saleable minerals and be made available for exploration and development of leasable minerals with NSO stipulation or not at all. Withdrawals from mineral entry would be pursued for the areas/sites discussed below.

- All existing withdrawals carried forward are listed in Table 2-5.

- Withdrawals from mineral entry would be pursued for research natural areas (RNAs) to protect the ecosystems being monitored as baseline data.

- Rivers or streams eligible for inclusion in the Wild and Scenic Rivers System and proposed for designation as wild would be withdrawn from mineral entry to conform with the Wild and Scenic Rivers Act.

- A withdrawal from mineral entry would be pursued for that portion of the recreation section of the Rogue River downstream from Yew Wood Creek, not presently withdrawn from mineral entry, to conform with other segments of the designated river section and to conform with the existing management plan.

- Mineral withdrawals would be pursued for all sites with significant capital improvements such as administrative sites, reaches of streams with fish improvements, and developed recreation sites following initiation of the investment.

- A withdrawal from mineral entry would be pursued for the Jacksonville Trail System. BLM and the city of Jacksonville plan to establish a trail system for recreation purposes. Any mining would impair the trail improvements and scenic values.

- A withdrawal from mineral entry would be pursued for Agate Flat, a well known agate collecting area frequented by rock clubs and collectors to keep the area open to the public.

- A withdrawal from mineral entry would be pursued for Galice Creek for recreational and cultural values.

Saleable Minerals

Saleable minerals, including common varieties of sand, gravel, rock, and stone, would be made available for local governments, private industry, individuals, and nonprofit organizations consistent with management objectives of other resources and consistent with the requirement that undue or unnecessary degradation be prevented. These needs would be met from community pits located throughout the planning area.

Rock quarries would continue to be used to provide rock for use in construction and maintenance of timber sale access roads and for other purposes. New quarry sites would be developed as needed if they are consistent with the management objectives of other resource values. All quarry development will include development and reclamation plans. Long-term regional quarry use would be emphasized. A districtwide quarry management plan would be developed to address development standards and reclamation goals.

Guidelines and restrictions for development of saleable minerals are presented in Appendix O.

Reserved Federal Mineral Estate

The reserved federal mineral estate (federal minerals underlying nonfederal surface) would continue to be open for mineral development in the same manner and degree as adjacent BLM-administered land. Conveyances of mineral interest owned by the United States where the surface is or will be in nonfederal ownership could be made to the existing or proposed owner of the surface estate consistent with FLPMA Section 209(b).

Rural Interface Areas

The rural interface area (RIA) is defined as BLM-administered land within one-quarter mile to one-half mile of private lands zoned 1-5 acre lots or 5-20 acre lots. Timber harvest practices and other management activities would be altered or restricted within the managed RIA as defined in each alternative.

The following direction is common to all BLM-administered land within one-half mile of private lands zoned 1-20 acre lots.

- Prescribed fire and other methods would be used to reduce fuel hazards.
- Known public hazards such as abandoned mining tunnels and quarries would be reduced.

Dust abatement would occur on existing roads within RIAs during periods of BLM timber or other BLM commodity hauling when appropriate. Dust abatement would be encouraged and enforced from haulers using BLM roads under permits and right-of-way agreements.

Fire

The planned application of prescribed fire to meet various resource management objectives and the protection of public land from the effects of wildfire would be implemented as part of all alternatives within the planning area.

The application of prescribed burning is divided into two management area objectives.

Fire use areas: These are areas where prescribed fire is planned to meet site preparation (planting) objectives, vegetative management objectives, and other resource management uses. This includes meeting objectives of ecosystem management, special area management (i.e., RNA and ACEC), wildlife habitat management, and timber management.

Fire fuels management areas: These are areas where fuels management activities are planned to reduce high fuel hazard levels in order to lessen the risk of a wildfire occurring, thereby reducing future fire suppression costs and resource loss.

Fire use areas and fire fuels management areas discussed under the preceding management topics are summarized in Table 2-9.

Wildfire protection in the planning area is currently contracted through the Western Oregon Protection Contract. The primary contractor is the State of Oregon through the Oregon Department of Forestry (ODF). The contract covers all presuppression detection and wildfire suppression activities in the planning area. While prompt and rapid initial attack and suppression of all wildfires is the overriding objective of the protection contract, consideration is also given to meeting BLM's resource management objectives.

Two levels of wildfire suppression would be applied:

- Intensive fire suppression: This level would be applied where unacceptable resource damage would occur from a wildfire of any intensity at any time of the year.
- Conditional fire suppression: This level would be applied where the level of the suppression action is not fixed and can vary due to weather, fire behavior, and availability of suppression resources at the time of ignition.

The level of suppression action required for resource management objectives is summarized from the preceding management topics in Table 2-9. Also included are possible restrictions on the use of specific suppression resources such as mechanized equipment in riparian areas and a summary of management objectives for the use of prescribed fire.

Livestock Grazing

Scoping of the Draft RMP/EIS raised two administrative concerns: clarification of the term "initial stocking animal unit months (AUMs)," and criteria for activation of vacant allotments and activation of allotments with a history of short-term nonuse.

The Grazing EIS defines an "initial livestock forage use level" based upon the grazing preference. If the grazing for an allotment were adjusted, the livestock allocation level would be similarly adjusted. In other words, "initial forage use" is synonymous with preference.

Livestock operators often modify their operations and associated use of public lands for a variety of reasons. These modifications occasionally result in requests for partial or total nonuse of grazing leases. Grazing allotments may also become unused or "vacant" as the result of sales, death, or the livestock operation goes out of business.

Where an allotment has remained vacant or substantially understocked for several years, the BLM may consider manageability criteria prior to fully stocking the allotment. Manageability is an appraisal of the grazing lease application. Since BLM has the responsibility for sound management practices, the applications would be screened using the following criteria.

- Resource conflicts which could require modification of historical grazing use or practices.
- Condition of existing range improvements to accommodate grazing (i.e., fences, water facilities, seedings).
- Consistency with objectives identified for the allotment or area.

Based upon assessment of the manageability it may or may not be necessary to restrict active use to an amount less than the total active grazing preference. In some situations, the livestock operator will be encouraged to cooperatively develop an agreement to gradually increase the grazing use without adversely affecting other resources or management objectives.

Nonuse of grazing leases are managed in accordance with the manual and regulations of the BLM. Barring conflicts with new administrative procedures, the Medford District BLM would adhere to the following guidance for nonuse.

- Nonuse for the convenience of the operation may be approved for up to three years.
- Nonuse for conservation reasons to meet management objectives may be approved for a period of up to 10 years.

As these are administrative clarifications, it is anticipated there would be no environmental consequences beyond those analyzed in the Grazing EIS.

Noxious Weed Control

Treatment of noxious weeds to control infestations on BLM-administered land would be designed using an integrated pest management approach. Chemical, mechanical, and biological methods would be considered. Application and monitoring of the effects of herbicides would be done in accordance with BLM's Multi-State EIS, Northwest Area Noxious Weed Control Program, 1986, as supplemented in 1987, and the related Record of Decision (see Appendix 1-C, Draft RMP). Some noxious weeds expected to be subject to control are shown below.

Common Name	Scientific Name
Rush skeleton weed	*Chondrilla juncea*
Tansy ragwort	*Senecio jacobaea*
Yellow star thistle	*Centaurea solstitialis*
Scotch broom	*Cytisus scoparius*
Puncturevine	*Tribulus terrestiris*
Canada thistle	*Cirsium arvense*
Leafy spurge	*Euphorbia esula*
Diffuse knapweed	*Centaurea diffusa*
Purple loosestrife	*Lythrum salicaria*

Hazardous Materials

The transportation, storage, and handling of hazardous materials (anything that poses a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed) would be in accordance with manufacturers' specifications and applicable laws such as the Resource Conservation and Recovery Act, Emergency Planning, Community Right-to-Know Act, and other environmental laws.

Any release, unauthorized dumping, abandoned, or inactive waste disposal site suspected of involving hazardous wastes would be reported, assessed, and treated in accordance with the District's Hazardous Materials Contingency Plan, the federal Water Pollution Control Act, the Clean Air Act, the Comprehensive Environmental Response, the Compensation and Liability Act, and other applicable state and federal environmental laws.

No Action Alternative

This alternative projects all land allocations and management actions in the existing plan into the next decade. The two land use plans (as amended) that cover the planning area are the Josephine Management Framework Plan (MFP) and Record of Decision (ROD) and the Jackson/Klamath MFP and ROD. Some allocations have been changed due to miscellaneous land sales and exchanges.

Water Quality and Riparian Zones

Stream and riparian zone management for the existing plan is identified by stream class.

Class 1 Streams (generally order 3 and greater): Provide habitat for salmon and/or steelhead. A horizontal 100-foot average width riparian management area (RMA) would be established on each side. Harvesting would not be permitted in the RMA except to benefit wildlife, salvage dead trees after a devastating fire, or create yarding corridors across streams. When necessary, directional felling would be used to harvest within a tree length of Class 1 streams and RMAs, protect riparian habitat, streamside stability and other vegetation. When yarding across Class I streams, complete suspension would be provided whenever practical. If complete suspension cannot be achieved, yarding corridors would be designated.

Class 2 Streams (generally orders 3, 4, and 5): Provide habitat for resident trout but not for anadromous fish species. A minimum 50-foot (Josephine sustained yield unit (SYU)) or 100-foot (Jackson/Klamath SYU) horizontal average width RMA would be established on each side (Josephine SYU). Harvesting adjacent to the RMA would meet the following objectives/goals for water quality.

- Minimize disturbance to stream banks, adjacent slopes, and headwall areas;
- minimize surface erosion in or around logged areas;
- minimize accelerated debris loading of streams; and
- maintain or reduce maximum summer stream temperatures.

Class 3 Streams (generally order 3, 4, and 5): Streams that are non-fish-bearing perennial streams. Streams appropriated for domestic use are included in this category if they do not have direct fisheries values. Sufficient streamside vegetation would be maintained to meet the following objectives/goals for water quality.

- Minimize disturbance to stream banks, adjacent slopes, and headwall areas;
- minimize surface erosion in or around logged areas;
- minimize accelerated debris loading of streams; and
- maintain or reduce maximum summer stream temperatures.

Class 4 Streams (generally order 2 or 3 streams): Intermittent streams that flow most of the year but cease to flow during the dry season. Sufficient streamside vegetation would be maintained to meet the following objectives/goals for water quality.

- Minimize disturbance to stream banks, adjacent slopes, and headwall areas;
- minimize surface erosion in or around logged areas; and
- minimize accelerated debris loading of streams.

Class 5 Streams (generally order 1 or 2 streams): Ephemeral streams that flow only during and immediately after periods of precipitation or the melting of snow. Objectives/goals for Class 5 stream water quality would be to minimize disturbance to the channel bottom and provide for reforestation of harvested areas.

Old Growth and Mature Forest

No older forest would be specifically protected under this alternative. However, lands not available for timber management would contribute to the retention, maintenance, or reestablishment of mature and old growth forest (riparian zones, wilderness, recreation sites, withdrawn lands, special areas, etc.). These forestlands total 191,700 of which 40,400 acres is old growth and 88,300 acres is mature forest (see Tables 2-10 and S-1).

Timber

Of 458,500 acres of forestland inventoried as suitable for timber production in the 1977 timber production capability classification (TPCC), 439,200 acres (96 percent) would be available for intensive timber management. These lands are considered capable of being reforested within five years after harvest and managed without irreversible resource damage based on the 1977 TPCC.

In this alternative, 5,200 acres would be available for restricted timber management. See Table S-1 for comparisons of acres available for timber production.

A program for trial harvest on 108,289 acres of lands classified as low intensity management (LIM) lands was terminated in 1985 and would not be included in this alternative.

Harvest and Timber Production Practices

Projected 10-year acres for timber harvest and other timber management activities are shown in Table S-1. The planned annual timber sale quantity for the expected 10-year life of the plan would be 36 mmcf (194 mmbf Scribner short log). No harvest is assumed from woodlands or other lands not allocated to timber management, but salvage would be permitted under special silvicultural prescriptions to ensure nontimber resource objectives would be met where possible.

Silvicultural Systems Utilized

Silvicultural systems would be principally even-aged. Harvest methods prescribed on any particular site would be based on site-specific biological factors, management objectives, and constraints and would utilize recent advances in science and management techniques to best achieve desired results.

Silvicultural practices utilized would be generally the same as those shown in Appendix 2-T-1, Draft RMP.

Special Status (Including Threatened and Endangered) Species Habitat

BLM management and permitting actions would be designed to conserve habitat of special status species (i.e., Category 1 and 2 federal candidate, state listed and Bureau-sensitive species). See Table 2-11 for a list of special status animal species and Table 3-SP-1 for a list of special status plant species known to exist on BLM-administered land in the planning area. The objective is to recover listed species and prevent the listing of other species. There would be 250 acres allocated to special status plant species. This would not include RNAs and ACECs that are designated for special status plants (i.e., Woodcock Bog, Eight Dollar Mountain, King Mountain, and Table Rocks). There are about 5,100 acres that would be allocated for special status animal species (raptors and Northern spotted owls). Of these 5,100 acres, just over 3,000 acres are allocated to provide habitat for 14 northern spotted owl management areas (SOMAs).

Bald Eagles

Jackson SYU - Prohibit use of toxic chemicals within 330 feet of the nest, prohibit human entry and low level aircraft operations within 660 feet of the nest approximately February 1 through August 15, and prohibit logging within a communal roost area.

Josephine SYU - Avoid road construction and recreation construction near nests as much as possible.

A 30-acre core area would be retained around known bald eagle nest sites.

Wildlife (Including Fisheries) Habitat

Standing snags and culls would be retained on the edges of clearcuts and shelterwood units. An average of at least one 24-inch dbh snag, one similar cull, and three other snags would be retained for each two acres.

About 3,700 acres along 303 miles of streams would be managed for riparian values. Riparian buffer strips would average 50 and 100 feet from each side of resident trout and anadromous fish-producing streams respectively in the Josephine SYU and 100 feet on each side of all fishery streams in the Jackson-Klamath sustained yield unit (SYU).

Special habitats would be managed on a site-specific basis.

Dryland hardwoods would be managed for firewood if accessible.

Seasonal restrictions for mineral development would be imposed within deer winter ranges.

Special Areas

Eight existing special areas including three areas of critical environmental concern (ACECs), two research natural areas (RNAs), and three environmental education areas (EEAs) would continue to be managed in accordance with site-specific management plans or guidelines similar to those set forth in the management framework plans as amended. See Table 2-12 for a list of existing special management areas and how they would be managed under this alternative.

Recreation

Thirteen (13) developed recreation sites, 106 miles of hiking/horseback trails, 18 miles of cross-country ski trails, 32 miles of developed snowmobile trails, and 4,455 miles of BLM-controlled roads would remain open for visitor use and enjoyment. See Table 2-4 for a list of sites and trails available under this alternative. Off-road vehicle classifications (open, limited, closed) would continue as established in the current plans. See Table S-1 for acres classified under this alternative.

This PRMP does not address management of the Rogue National Wild and Scenic River, including the 30 existing developed sites.

Three special recreation management areas (SRMAs) would continue to be managed for their recreation value: Rogue National Wild and Scenic River, Hyatt-Howard Prairie lakes, and the Pacific Crest Trail.

Two back country byways would continue to be managed as components of the National Scenic Byway program: Grave Creek-Marial (33 miles) and Hellgate-Galice (39 miles).

Wild and Scenic Rivers

The Rogue National Wild and Scenic River (47 miles) would continue to be managed in accordance with federal guidelines. Management plans are currently being revised for the recreation and wild sections.

Visual Resource

Acres classified VRM I-IV in the current plans would continue to be managed in accordance with the standards established in those plans (see Table S-1).

Land Tenure Adjustments

The District would continue to pursue land sales, exchanges, and transfers of jurisdiction as defined in the current plans. Acres to be considered for sale or exchange total 3,682 acres and acres to be considered for transfer total 3,387 acres. Land tenure zones would not be identified for this alternative.

Energy and Minerals

Leasable minerals (oil and gas and geothermal resources) would be made available on the majority of the mineral estate administered by BLM. The majority would also remain open to location under the mining laws and to sale of minerals that are salable. See Tables 2-6, 2-7, and 2-8 for a comparison of mineral restrictions by alternative.

Rural Interface Areas

No rural interface areas would be specifically identified in this alternative. When operating near homes, BLM would continue to take precautions to protect the health and safety of residents.

Alternative A

Water Quality and Riparian Zones

Surface-disturbing activities on fragile nonsuitable woodlands would be permitted only if they would not reduce site productivity or degrade water quality.

Old Growth and Mature Forest

No lands are specifically allocated for retention, maintenance, and/or reestablishment of old growth and mature forest. However, lands not available for timber management would contribute to the retention, maintenance, or reestablishment of mature and old growth forest. These lands include the Rogue Wild and Scenic River, habitat protected for threatened and endangered species recovery, riparian management areas, and recreation sites. These forestlands total 45,500 acres of which 6,800 acres is old growth and 20,800 acres is mature forest (see Tables 2-10 and S-1).

Timber Lands Allocated to Timber Production

Under this alternative, 534,800 acres (96 percent of the total) of suitable commercial forestland would be available for intensive forest management, including lands determined to be economically marginal. In addition, 65,500 acres of suitable woodlands and 21,700 acres of fragile gradient woodlands would be allocated to timber management.

Probable Sale Quantity

Projected decadal acre accomplishments for silvicultural treatments and timber harvests are shown in Table S-1. The estimated annual timber sale quantity over the next decade would be 48.6 million cubic feet (mmcf) (292 million board feet (mmbf)). Of the estimated sale quantity, 46.7 mmcf is attributable to the base program (site preparation, reforestation including the use of genetically-selected stock, maintenance, and release). The balance of 1.8 mmcf is attributable to growth enhancing management practices (fertilization, precommercial thinning, commercial thinning, and stand conversion).

Additions to the Probable Sale Quantity

An additional average annual harvest of 1.9 mmcf (9.0 mmbf) would be sold from experimental harvests (similar to the LIM lands harvest program of the last decade) on suitable woodlands, nonsuitable commercial forestland, and nonsuitable fragile gradient woodlands.

These lands would be managed on an area regulation formula with a 150-year rotation in which 1/150th of the available acres would be planned for yearly harvest. Harvest systems would utilize natural reforestation approaches; retention of overstory trees; accomplishing site preparation; but relying on natural regeneration rather than planting. No investments for growth enhancing practices would be made on woodlands.

The probable sale quantity (PSQ) is shown by sustained yield unit (SYU) by alternative in Appendix 2-T-6, Draft RMP.

Table 2-13 displays the hardwood volume resulting from incidental harvest of hardwoods from conifer stands, stand conversion, and hardwood management.

Silvicultural Systems Utilized

Lands allocated to timber management would be managed with even-aged silvicultural systems except for those lands on which growing season frosts limit reforestation and growth. Frost hazard lands would be managed under shelterwood retention systems. In addition to the features of these systems described in Appendix 2-T-2, Draft RMP, the following would be used in this alternative.

- All suitable lands available for timber management, but currently occupied by grass, shrubs or hardwoods, would be converted to merchantable conifer species.
- Hardwood stands on those lands that are incapable of being converted to conifer stands would be actively managed to provide for the production of hardwood products including: sawtimber, firewood, biofuels, wood for chemicals, and other forest products.
- Minimum harvest age would not be restricted for even-aged stands but would be set at 100 years for shelterwood retention stands (frost areas).

Lands Not Allocated to Timber Management

Forestland unavailable for timber harvest would include recreation sites, riparian management areas, and areas required for bald eagle and peregrine falcon recovery (see Table S-1).

Special Status (Including Threatened and Endangered) Species Habitat

Habitats of threatened and endangered (T&E) species would be managed as required by law. BLM management and permitting actions would be designed to protect the habitats and prevent future listing of Category 1 and 2 federal candidate, state listed, and Bureau-sensitive plant and animal species where such actions would not diminish commercial use such as timber production. See Table 2-11 for a list of special status animal species known to exist on BLM-administered land in the planning area and their protection by alternative, and Table 3-SP-1 for a list of special status plant species.

Wildlife (Including Fisheries) Habitat

Wildlife

A summary of protection of priority animal species is shown in Table 2-14.

Roosevelt Elk

Roads would be blocked or closed to motor vehicle traffic to benefit elk habitat where it would not conflict with timber production or other management objectives.

Fisheries

No specific allocations or management direction other than those in Management Direction Common to All Alternatives would be made for fisheries under this alternative.

Special Areas

Upper and Lower Table Rocks ACEC (1,240 acres) would be designated because of the rare dwarf meadowfoam which does not occur anywhere else in the world. This ACEC also has unique historical, geological, scenic, and wildlife values. Environmental education use is significant at the Table Rocks ACEC because of the close proximity to schools and the variety of resources (see Table 2-12).

Two existing ACECs, King Mountain Rock Garden and Eight Dollar Mountain, would not be designated; and two existing RNAs, Woodcock Bog and Brewer Spruce, would not be designated under this alternative.

Recreation

One new potential recreation site (Eight Dollar Mountain Wayside), and one new potential trail (Jacksonville National Historic Landmark Trail), would be managed to maintain their potential for development. The potential site and trail would be developed as funding and opportunity are available. Two existing special recreation management areas (SRMAs) would not be managed primarily for their recreation opportunities under this alternative. See Table 2-4 for comparison of developed sites, trails, SRMAs, and back country byways (BCBW) that would be managed or maintained by alternative.

About 8,500 acres would be closed to off-highway vehicle (OHV) use, and 83,700 acres would be limited to OHV use. In the remainder of the planning area, about 775,300 acres would be open to OHV use. See Table 2-15 for potential OHV designation by alternative.

Wild and Scenic Rivers

No new river areas would be found suitable for designation as wild, scenic, or recreational rivers under this alternative.

Visual Resources

Lands allocated to intensive timber management would be managed as VRM Class IV. All other lands would be managed as inventoried. See Table S-1 for acres of each VRM Class by alternative.

Wilderness

If not designated wilderness, the Soda Mountain WSA (5,867 acres) and the Brewer Spruce ISA (429 acres) would not receive any special management or designation. Both areas would be available for timber harvesting.

Land Tenure Adjustments

Exchange of BLM-administered land would be made only to acquire lands that would enhance the management of the commercial forestland managed by BLM. Factors to be considered include: site quality, access to public forestland, logical logging units, and management of public forestland to facilitate timber harvest.

No commercial forestland would be sold or leased. Leases or transfer of title for other than commercial forestland would be made only under the Recreation and Public Purposes Act.

Rural Interface Areas

Resource management activities would not be restricted within rural interface areas (RIAs) under this alternative.

Exchange of BLM-administered land within sensitive RIAs would be pursued to enhance timber management (see Chapter 3, Rural Interface Areas).

Alternative B

Water Quality and Riparian Zones

Fragile nonsuitable woodlands would not be available for timber harvest, and other surface-disturbing activities would be prohibited unless adequately mitigated to maintain site productivity and protect water quality.

Land exchanges/acquisitions of public domain land could be used to obtain key riparian-wetland areas or to block up BLM ownership within watersheds.

Old Growth and Mature Forest

To provide for seral diversity, 51,100 acres would be precluded from timber harvest. These blocks, approximately 640 and 80 acres in size, are distributed in a corridor system by seed zone and elevation. These forestlands total 41,900 acres of which 11,000 acres is old growth and 17,100 acres is mature forest.

In addition to these seral diversity blocks, other lands not available for timber management would also contribute to the retention, maintenance, or reestablishment of mature and old growth forest. These lands include the Rogue Wild and Scenic River, habitat protected for threatened and endangered species recovery, riparian management areas, designated ACECs, and recreation sites. These forestlands total 106,300 acres, of which 16,500 acres is old growth and 36,200 acres is mature forest (see Table 2-10).

Timber

Lands Allocated to Timber Production

Under this alternative, 488,700 acres (87 percent of total) of suitable commercial forestland would be available for intensive forest management, and 7,700 acres (1 percent) would be available for restricted forest management. Lands determined to be economically marginal are included in the allocation. Restrictions on timber management are designed to protect visual resources on lands allocated to VRM Class II. In addition, 64,306 acres of suitable woodlands would be available for timber production (see Table S-1).

Probable Sale Quantity

Projected decadal acre estimates for silvicultural treatments and timber harvests is shown in Table S-1. The estimated annual probable sale quantity (PSQ) for the expected life of the plan would be 44.3 mmcf (266 mmbf Scribner) from suitable commercial forestland and 1.4 mmcf (6.5 mmbf Scribner) from woodlands.

Table 2-13 displays the hardwood volume resulting from incidental harvest of hardwoods from conifer stands, stand conversion, and hardwood management.

Silvicultural Systems Utilized

Intensive forest management allocation lands in this alternative would be managed with even-aged silvicultural systems, except for frost hazard areas which would be managed with shelterwood retention systems. Restricted lands would be managed with shelterwood retention systems. In addition to the features of these systems described in Appendix 2-T-1, Draft RMP, the following design features are used in this alternative.

- All suitable lands available for timber management but currently stocked with shrubs, hardwoods, or grass would be converted to merchantable conifer species.

- Within identified sensitive rural interface areas (RIAs), customary forest management practices would be altered where realistically feasible, to mitigate adjacent neighbors' concerns. Modification of practices would not result in significant yield loss.

- Minimum harvest age would not be restricted for even-aged stands but is set at 100 years of age for stands managed under shelterwood retention systems.

- Hardwood stands on those lands incapable of being converted to conifer stands would be actively managed to provide for the production of hardwood products including: sawtimber, firewood, biofuels, wood for chemicals, and other forest products.

Lands Not Allocated to Timber Production

All nonsuitable woodlands would be allocated to meet other resource needs. Other lands not allocated to timber production include: recreation sites, riparian management areas, designated ACECs, areas required for threatened and endangered species recovery, seral diversity blocks, and special status species habitat on public domain lands.

Special Status (Including Threatened and Endangered) Species Habitat

Habitats of all listed threatened and endangered (T&E) species would be protected. BLM management and permitting actions would be designed to protect habitats and prevent future listing of Category 1 and 2 federal candidate, state listed, and Bureau-sensitive species on Oregon and California (O&C) lands where such actions would not diminish commodity use such as timber production. However, habitats of special status species known to occur on public domain (PD) land would be protected by mitigating adverse effects. Field surveys would be conducted for those species suspected to be present in an area proposed for surface-disturbing activities.

Two federal candidate plant species, dwarf meadowfoam (*Limnanthes floccosa ssp. pumila*) and Cook's desert parsley (*Lomatium cookii*) found on no other federal lands, and other T&E species discovered in the future would be protected wherever found in the planning area. A plan of operation for mining would be required for areas containing known habitat of special status species.

Two federal candidate plant species (*Calochortus umpqua-ensis* and *Lomatium cookii*) currently have listing packages prepared and would be protected on all PD land and effects mitigated on O&C land when not diminishing commodity use. If effects could not be mitigated, technical assistance from USF&WS would occur.

Bald Eagle (Federal Threatened Species)

Where opportunities exist, lands would be acquired to facilitate management within one-half mile of active sites.

Peregrine Falcon (Federal Endangered Species)

Where opportunities exist, lands would be acquired to facilitate management within one mile of active sites.

Siskiyou Salamander and Del Norte Salamander (Federal Candidate Species)

Surface-disturbing activities would be avoided where feasible, within 100 feet of talus habitat where the species is found on PD land. Potential habitat would be inventoried for these species.

Jenny Creek Sucker and Redband Trout (Federal Candidate Species)

Timber harvesting and other surface-disturbing activities would be prohibited on PD land within steep canyon areas along Jenny Creek and tributaries.

Wildlife (Including Fisheries) Habitat

Wildlife

On lands allocated to timber management, the following would apply.

- Snags and unmerchantable cull trees would be retained to provide nest sites for a minimum of 40 percent of optimum cavity excavator populations, both for present needs and for sustainability over the long-term. This level generally corresponds to approximately 120 snags per 100 acres of forested habitat.

- Coarse woody debris would be retained to provide approximately 300 tons per 100 acres, with at least 300 pieces greater than 16 inches in diameter and 12 feet long.

Roosevelt Elk

Within elk management areas, the following objectives and restrictions would apply.

- Roads would be blocked or closed to motor vehicle traffic to benefit elk habitat where it would not conflict with timber production or other management objectives.
- Where consistent with timber management practices, subwatersheds would be managed to meet the following target habitat conditions: 20 percent forage, 30 percent hiding cover, and 30 percent thermal and optimal cover. Where needed, permanent forage areas would be created and maintained on lands not allocated to timber management to help meet these targets.
- Clearcuts and other regeneration harvest units could be seeded with forage plant species where it would not conflict with timber production.
- Lands would be acquired to facilitate management of elk habitat.

Fisheries

No specific allocations or management direction, other than those in Management Direction Common to All Alternatives, would be made for fisheries under this alternative.

Special Areas

All three existing ACECs (2,577 acres), two RNAs (670 acres), and three EEAs (30 acres) would be retained as special areas. One additional area, Round Top Butte (600 acres), would be designated as an RNA (see Table 2-12).

Recreation

Five new potential recreation sites and two new potential trails would be managed to maintain their potential for development. These potential sites would be developed as funding and opportunity exist. Two existing special recreation management areas (SRMA) would not be managed primarily for their recreation opportunities under this alternative. See Table 2-4 for comparison of developed sites, trails, SRMAs, and back country byways (BCBW) that would be managed or maintained by alternative.

About 9,700 acres would be closed to off-highway vehicle (OHV) use, and 144,100 acres would be limited to OHV use. In the remainder of the planning area, about 697,500 acres would be open to OHV use. See Table 2-15 for potential OHV designation by alternative.

Wild and Scenic Rivers

No river areas would be found suitable for designation as wild, scenic, or recreational rivers under this alternative.

Visual Resources

Land within one-quarter mile of developed recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and Scenic Rivers Act would be managed as inventoried. Land allocated for uses other than timber production would also be managed as inventoried.

Land within one-quarter mile of the 1-5 acre category of designated rural interface areas (RIAs) would be managed under VRM Class III management objectives. All other land available for timber harvest would be managed as VRM Class IV. See Table S-1 for acres of each VRM Class by alternative.

Wilderness

If not designated wilderness, the Soda Mountain WSA (5,867 acres) and the Brewer Spruce ISA (429 acres) would not receive any special management or designation. Both areas would be available for timber harvesting.

Land Tenure Adjustments

Exchange of O&C land would be made primarily to acquire lands which would enhance timber management opportunities. Exchange of public domain (PD) land would be made to benefit one or more of the resources managed, including nontimber values.

Sale of O&C land other than commercial forestland and public domain land would be made to dispose of lands that meet any of the criteria of FLPMA, Section 203(a).

Leases or conveyances under the Recreation and Public Purposes Act (R&PP) would be made in zones 2 and 3 to provide appropriate facilities or services. FLPMA, Section 203, leases of BLM-administered land, except O&C commercial forestland, would be made to accommodate other uses.

Rural Interface Areas

Resource management activities would be altered, where feasible, on 32,400 acres of BLM-administered land within one-quarter mile of private land in identified rural interface areas (RIAs) (zoned for 1-5 acre lots) to mitigate adjacent neighbors' concerns. These lands would also be managed under VRM Class III objectives. Examples of management options that could be used include harvest regimes other than clearcutting, hand application rather than aerial application of herbicides and pesticides, and hand piling slash for burning as opposed to broadcast burning. A summary of identified RIAs is shown in Table 2-16.

Alternative C

Water Quality and Riparian Zones

General management objectives for streams and RMAs are listed below.

- Water Quality: Meet or exceed state water quality standards.
- Stream Ecosystem: Maintain or improve the biological, chemical, and physical functions of the stream ecosystem. (Coarse woody debris is a major component of stream ecosystems, controlling the distribution of aquatic habitats, providing habitat and food source for invertebrates and amphibians, spawning and rearing habitat for fish, stability of streambeds and streambanks, and routing of sediments and water through the stream ecosystem.)
- Riparian Ecosystem: Maintain or improve riparian habitat for wildlife and native plant diversity.

Actual riparian management areas (RMAs) widths would be determined using the widths shown in Table 2-1 in conjunction with on-the-ground stream characteristics, riparian vegetation, soil, and topography to meet specific management objectives listed by stream type (see Table 2-20).

Fragile nonsuitable woodlands would not be available for timber harvest, and other surface-disturbing activities would be prohibited unless adequately mitigated to maintain site productivity and protect water quality.

New road construction would be minimized on granitic and pyroclastic soil areas to protect water quality and reduce surface erosion. Where necessary and practical, appropriate methods would be used to stabilize cutslopes, ditchlines, and fill slopes on all existing road systems in fragile soils (e.g., West Evans and Upper Lake creeks) that are to remain open for public or administrative use. Temporary spur roads would be restored to near original condition by methods such as scarifying the road bed, planting tree seedlings or grass, restoring the natural ground contour, and water barring.

Land exchanges/acquisitions could be used to obtain key riparian-wetland areas or to block up BLM ownership within watersheds.

Old Growth and Mature Forest

A system of old growth restoration and retention (R&R) blocks (approximately 152,000 acres) would be managed to restore or retain old growth communities and representative plant communities. Individual blocks selected as old growth R&R areas are approximately 600 to 2,500 acres in size. They are located primarily within biological connectivity corridors designed to provide linkage between the major reserved lands of the Siskiyou, Umpqua, and Rogue River National Forests (see Map C). Other blocks were selected to better retain special status species (plants and animals), representative major plant groups, identified tree breeding zones, hardwood stands, and special habitats, as well as old growth ecological characteristics. These forestlands total 121,500 acres of which 27,600 acres is old growth and 38,900 acres is mature forest. The R&R blocks would not be subject to planned timber harvest except for density management thinnings designed to help the R&R blocks attain old growth characteristics. Any volume resulting from density management in these blocks would not be calculated as part of the planned PSQ.

Within old growth R&R blocks, an assessment of wildfire potential would be completed. This assessment would be based on existing fuel hazard and the historic frequency of wildfire occurrence within the area. A fire/fuels assessment would then be completed to evaluate the need to restore the use of fire (prescribed burns) within the area. Intensive suppression strategies would be used when controlling wildfires within the R&R blocks.

Lands within identified biological corridors and in buffers around R&R blocks (146,300 acres) would be managed under a high level of partial retention in order to serve as potential replacement for old growth R&R blocks lost to natural events (see Timber Resources).

No new roads would be constructed in the R&R blocks except for density management purposes. Only arterial and major collector roads would remain open to the public in these areas. All other existing roads would be closed.

Cooperative agreements and/or acquisitions would be pursued with private landowners and other land management agencies to optimize the extent and distribution of old growth blocks while minimizing undue impact on multiple resource use.

Other lands not available for timber management would also contribute to the retention, maintenance, or reestablishment of mature and old growth forest. These lands include the Rogue Wild and Scenic River, threatened and endangered (T&E) and special status species habitat, riparian management areas, designated ACECs, and recreation sites. The total forestlands available for the retention, maintenance, or reestablishment of old growth and mature forests would be about 265,900 acres of which 45,600 acres is old growth and 89,700 acres is mature forest (see Tables 2-10 and S-1).

Timber

Lands Allocated to Timber Production

Under this alternative, 401,100 acres (72 percent of the total) of suitable commercial forestland would be available for restricted forest management, including available lands determined to be economically marginal under conventional even-aged management. No lands would be available for intensive forest management (see Table S-1).

Probable Sale Quantity

Projected 10-year acres for timber harvest and other timber management activities are shown in Table S-1. The estimated annual PSQ for the expected 10-year life of the plan would be 10.6 mmcf (62 mmbf Scribner). Because this alternative includes many elements recognized to be substantially untested, modeling its sustainable timber yield is more difficult than with the other alternatives. Therefore, the level of confidence in the preceding numbers is lower.

Table 2-13 displays the hardwood volume resulting from incidental harvest of hardwoods from conifer stands, stand conversion, and hardwood management.

Silvicultural Systems Utilized

All forestland allocated to timber management in this alternative would be managed under structural retention silvicultural systems. Lands available for timber harvest would be managed under two different scenarios depending on their relationship to R&R blocks and biological corridors. Forestland (146,300 acres) within the biological corridors and those identified as buffers (one to two miles around the R&R blocks) would be managed for a high level of green-tree retention. Forestland (254,700 acres) outside of corridors and buffer blocks would be managed for a lower level of green-tree retention.

Silvicultural prescriptions, as well as harvest unit size and spatial distribution, would be designed to achieve the highest level of timber production possible consistent with the protection of ecosystem health, long-term retention and restoration of biological diversity, site productivity, retention of dead and down woody debris, and other management objectives. Such prescriptions would include the principles of ecosystem-based forestry which strive to maintain complex ecosystem structures, functions, and species diversity across the landscape. Prescriptions would be designed to assure the regeneration of all indigenous tree species. They would vary dependant on plant community, site characteristics, stand condition, management objectives, and would include both density management and/or regeneration harvests.

In addition to the features of these systems described in Appendix 2-T-1, Draft RMP, the following design features would be used in this alternative.

- Prescribed fire would be used as a favored tool for site preparation and fuel reduction. It would be used to encourage natural regeneration and to restore or retain natural ecological processes through site disturbance. Herbicides would be applied only by individual stem injection or spot application.

- In suppressing wildfires, conditional suppression strategies would be utilized in late, mature, or old growth seral stages. Intensive fire suppression strategy would be utilized in the early and mid-seral stages.

- Fertilization would be used where relevant to supplement natural nitrogen fixation, enhance growth, and hasten development of vertical structure and large trees. Fertilization would not be assumed to contribute to the allowable sale quantity in multiple canopy silvicultural regimes during the first decade.

- New roads would be constructed to the lowest practical standard and density consistent with resource protection and multiple value use. Road management, including closure, would be applied to reflect biological diversity and multiple use needs.

- All existing dead non-merchantable material and live green culls (such as chip culls) required to meet specified target stand conditions would be reserved. Green culls available beyond those required as reserve could be removed.

- To minimize the regeneration period, artificial regeneration would be used to supplement natural reforestation. Planting would occur at minimum needed densities using a mix of native species (generally based on the percentage of species existing in the stand) to help assure species diversity.

- A maximum of 50 percent of Douglas-fir planting stock within a reforestation unit would be grown from genetically-selected tree seed. This seed would be collected from either selected trees growing in natural stands or from seed orchards developed from selected trees.

- Suitable and available forestland dominated by grass, shrubs, or hardwoods which resulted from human activity would be reconverted to conifers. Hardwoods would be retained in the reestablished stand at a level consistent with identified target stand objectives.

- After a transition period to complete stand maintenance on clearcuts created by past management, aerial application of herbicides would decline to a negligible level.

- Hardwood stands could be managed for production of hardwood timber on an area regulation basis. Up to 1/200th of the total acreage inventoried in such a category could be harvested per year per sustained yield unit. White oak woodlands along with grassland and meadow vegetation would be managed to meet biological diversity objectives in addition to potential hardwood timber production.

- In conifer stand management, native hardwoods would be retained or restored if they occurred naturally within the major plant grouping.

- Rotation length would be set at 150 years.

Lands Not Allocated to Timber Production

No woodlands are planned for timber harvest. Naturally occurring shrub and hardwood stands would be assumed to represent desired or natural conditions and would not be converted to conifer stands. Other lands unavailable for planned forest management include R&R blocks, recreation sites, riparian management areas, designated ACECs, and T&E and special status species habitat.

Special Status (Including Threatened and Endangered) Species Habitat

Habitats of all listed threatened and endangered (T&E) species would be protected. BLM management and permitted actions would be designed to protect habitats and prevent future listing of Category 1 and 2 federal candidate, state listed, and Bureau-sensitive species on Oregon and California (O&C) lands where such actions would not diminish commodity use such as timber production. However, habitats of special status species known to occur on public domain (PD) land would be protected by mitigating adverse effects. Field surveys would be conducted for those species suspected to be present in an area proposed for surface-disturbing activities.

Federally listed or proposed threatened or endangered species and candidate plant species found only on BLM-administered land (only two species known: dwarf meadow-foam (*Limnanthes floccosa* spp. *pumila*) and Cook's desert parsley (*Lomatium cookii*)) would be protected. In addition, federal candidate, state listed, and Bureau-sensitive species would be protected with 100-foot buffers, seasonal restrictions, and other measures on all PD land, land not allocated or available for timber harvesting, and on O&C land where required mitigation would be compatible with timber production. See Table 2-11 for a list of special status animal species and Table 3-SP-1 for a list of special status plant species known to occur in the planning area.

Lands would be acquired to facilitate management and protection of special status plant and animal species to help prevent future listings.

Plants

To enhance or maintain biological diversity, 7,700 acres of the R&R blocks (see Retention, Maintenance and/or Reestablishment of Old Growth and Mature Forest) would be allocated as special status plant blocks. These blocks would protect habitat in an area where 12 special status plants are found and would be managed similarly to the R&R blocks previously described (see Map C and Table S-1).

Two federal candidate plant species, *Calochortus umpquaensis* and *Lomatium cookii*, currently have listing packages prepared and would be protected on all PD land and impacts mitigated on O&C land when not diminishing commodity use. If impacts could not be mitigated, technical assistance from USF&WS would occur.

Animals

Bald Eagle (Federal Threatened Species)

One block of at least 30 acres would be managed for nesting habitat to provide for future population expansion within one-half mile of each of the following water bodies: Galesville Reservoir, Illinois River, Emigrant Lake, Hyatt Lake, Howard Prairie, and Lost Creek Reservoir. Within these blocks, the habitat would be managed to requisite forest habitat characteristics including large trees, snags, and at least 50 percent canopy closure. These blocks would be designated fire fuels management areas to reduce fuel loadings. There would be no timber harvest except to benefit bald eagle nest habitat, no new road construction, and no surface occupancy (NSO) for leasable minerals.

The core area around known bald eagle nest sites (approximately 10-70 acres) would be withdrawn from mineral entry.

Peregrine Falcon (Federal Endangered Species)

Potential nest cliffs would be managed to provide for future population expansion. The cliffs themselves would be protected and enhanced if necessary. No new road construction would be permitted within one-half mile of these potential nest sites unless the activity would not adversely affect the integrity of the site, and there would be no surface occupancy (NSO) for leasable minerals. These potential nest sites would be retained under BLM administration.

Northern Spotted Owl (Federal Threatened Species)

Human activities which may disturb owl nesting, especially use of large power equipment, would be prohibited within one-quarter mile of all active northern spotted owl nest sites from March 1 to September 30.

Townsend's Big-Eared Bat (Federal Candidate Species)

Approximately 30 acres around known colony caves would be protected. Within this area, dense forest conditions, if present, would be retained or restored where possible. No new road construction would be permitted, and human disturbance would be minimized. Seasonal recreational use of these caves could be permitted if it would not interfere with the bats. NSO would be allowed for leasable minerals. All BLM-administered land would be retained in federal ownership. Caves and mine adits would be inventoried for bats.

Siskiyou Salamander and Del Norte Salamander (Federal Candidate Species)

Surface disturbing activities would be avoided where feasible within 100 feet of talus habitat where the species is found. Potential habitat would be inventoried for these species.

Jenny Creek Sucker and Redband Trout (Federal Candidate Species)

Timber harvest and other surface-disturbing activities would be prohibited within steep canyon areas along Jenny Creek and tributaries.

Management direction discussed under Alternative C for Fisheries also applies to the above species.

Wildlife (Including Fisheries) Habitat

Wildlife

On lands allocated to timber management, the following would apply.

- Snags, live cull trees, and green merchantable trees would be retained to provide nest sites for a minimum of 60 percent of optimum cavity nester populations, both for present needs and sustainability over the long-term. This level corresponds to approximately 180 snags greater than 16 inches dbh per 100 acres of forested habitat.

- Coarse woody debris would be retained to provide approximately 1,100 tons per 100 acres, with at least 1,000 pieces greater than 16 inches diameter and 12 feet long.

Raptors and Great Blue Heron

New nest sites, centers of activity, or rookeries would be identified and protected as necessary to maintain the integrity of the site. Human disturbances that may disturb or interfere with successful nesting would be prohibited within one-quarter mile of known nesting areas between approximately March 1 and July 15.

Roosevelt Elk

Within elk management areas, the following objectives and restrictions would apply.

- Roads would be managed through use of gates and other types of road barricades to limit motorized vehicle use to an open road density of 1.5 miles per square mile where possible.

- Lands would be acquired to facilitate management of elk habitat.

- A target of at least 20 percent of the landscape would be maintained in an early seral stage for forage areas. Permanent forage areas would be created and maintained on lands not allocated to intensive restricted timber harvest to help meet this target.

- Only plant species indigenous to the area would be used when revegetating sites for erosion control, forage enhancement, timber production, or other purposes.

- Elk management areas would be designated as fire use areas.

Special Habitats

Special habitats such as wetlands, meadows, and caves would receive 100 to 200-foot wide protective buffers (see Table 2-17).

Oak Stands

White oak woodlands would be managed to maintain or enhance values for wildlife habitat, range, botanical values, and biological diversity. These white oak woodlands would be designated as conditional fire suppression areas and as fire use areas.

Fisheries

Coordinated activity management plans would be prepared for the following priority watersheds in conjunction with other agencies and private landowners. Plans would emphasize management of BLM special status and priority fish species and would be consistent with management direction for this alternative.

The priority watersheds are:

Jenny Creek:	Jenny Creek sucker, redband trout
West Evans Creek:	Summer and winter steelhead, coho salmon
Illinois River:	Winter steelhead, coho salmon
Cow Creek:	Winter steelhead, coho salmon

BLM-ownership in the watersheds shown on Table 2-16 would be blocked up to improve watershed management for:

- Federal candidate fish and amphibian species (Jenny Creek sucker, redband trout, and western pond turtle);

- State of Oregon and American Fisheries Society sensitive fish species (coho salmon, winter and summer steelhead); and

- To help prevent decline of other priority fish species in other watersheds.

BLM-ownership in these watersheds is at least 50 percent.

Special Areas

All three existing ACECs (2,577 acres), two RNAs (670 acres), and three EEAs (30 acres) would be retained as special areas. Additionally, 11 new ACECs (101,900 acres) and 7 new RNAs (5,994 acres) would be designated as special areas (see Table 2-12).

Recreation

Six areas would be designated and managed as special recreation management areas (SRMAs). Thirty-three new potential recreation sites and two new potential trails would be managed to maintain their potential for development. These potential sites and trails would be developed as funding and opportunity exist. Five new back country byways (BCBWs) would be designated. See Table 2-4 for comparison of developed sites, trails, SRMAs, and BCBWs that would be managed or maintained by alternative.

Mineral withdrawals would be pursued for Lower Galice Creek (downstream from the North Fork of Mill Creek) and Agate Flat to provide opportunities for recreational gold panning, dredging, and rock collecting.

About 27,200 acres would be closed to off-highway vehicle (OHV) use, and 519,500 acres would be limited to OHV use. In the remainder of the planning area, about 320,800 would be open to OHV use. See Table 2-15 for potential OHV designation by alternative.

Wild and Scenic Rivers

No new river areas would be found suitable for designation as wild, scenic, or recreational rivers under this alternative.

Visual Resources

Lands allocated to timber management where BLM-administered ownership consists of more than half of a viewshed would be managed as inventoried. Also, available forestland adjacent to (within one-quarter mile) developed recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and Scenic Rivers Act would be managed as inventoried. Land within one-quarter mile of designated RIA categories of 1-5 acres and 6-20 acres would be managed to meet VRM Class III management objectives. All other land available for timber harvest would be managed as VRM Class IV. See Table S-1 for acres of each VRM Class by alternative.

Wilderness

If not designated wilderness, the Soda Mountain WSA (5,867 acres) would be managed as part of the Siskiyou Mountain ACEC (20,000 acres) and the Brewer Spruce ISA (429 acres) would be managed as an ACEC/RNA.

Land Tenure Adjustments

Exchange of PD land would be made to benefit one or more resources, including non-timber values. Exchange of O&C land would emphasize opportunities that would contribute to conservation of biological diversity or enhance timber management opportunities.

Sale of O&C land other than commercial forestland and PD land would be made to dispose of lands that meet any of the criteria of FLPMA, Section 203(a).

Leases or conveyances under the Recreation and Public Purposes Act would be made in zones 2 and 3 to provide appropriate facilities or services. FLPMA, Section 302, leases of BLM-administered land, except O&C commercial forestland, would be made to accommodate other appropriate uses.

Rural Interface Areas

Resource management activities would be altered where feasible on 137,500 acres of BLM-administered land within one-quarter mile of private land in identified RIAs (zoned for 1-20 acre lots) to mitigate adjacent neighbors' concerns (see Table S-1). These lands would also be managed under VRM Class III objectives. Examples of management options that could be used include harvest regimes other than clearcutting, hand application rather than aerial application of herbicides and pesticides, and hand piling slash for burning as opposed to broadcast burning.

Manage and design road systems to reduce public health and safety hazards, fire risks, and vandalism to public and private property. Of particular concern is unauthorized public use of nonthrough or "local" roads within rural interface areas and within one-quarter mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate.

Alternative D

Water Quality and Riparian Zones

General management objectives for streams and RMAs are listed below.

- Water Quality: Meet or exceed state water quality standards.
- Stream Ecosystem: Maintain or improve the biological, chemical, and physical functions of the stream ecosystem. (Coarse woody debris is a major component of stream ecosystems, controlling the distribution of aquatic habitats, providing habitat and food source for invertebrates and amphibians, spawning and rearing habitat for fish, stability of streambeds and streambanks, and routing of sediments and water through the stream ecosystem.)
- Riparian Ecosystem: Maintain or improve riparian habitat for wildlife and native plant diversity.

Actual RMA widths would be determined using the widths shown in Table 2-1 in conjunction with on-the-ground stream characteristics, riparian vegetation, soil, and topography to meet specific management objectives listed by stream type (see Table 2-20).

Fragile nonsuitable woodlands would not be available for timber harvest, and other surface-disturbing activities would be prohibited unless adequately mitigated to maintain site productivity and protect water quality.

Surface-disturbing activities would be limited on all lands dominated by fragile granitic, schist, and pyroclastic soils (approximately 85,300 acres) to minimize losses to site productivity, reduce soil erosion, and minimize water quality degradation (see Table S-1). These soils are scattered throughout the planning area. However, the largest concentrations of soils formed from decomposed schist and/or granitic parent material occur in Evans, Snow, Sugar, and Meadow creeks, upper portions of Williams Creek, and headwaters of Birdseye Creek. Soils formed in deeply weathered pyroclastic parent materials are predominantly found in the foothills of the Cascades. Restrictions to meet the soil and water objectives could include, but are not limited to, no facility construction, shelterwood retention harvest system, minimal impact or no road construction and rights-of-way disturbance, no tractor yarding, seasonal restrictions on surface-disturbing activities, and broadcast burning only when cool burns could be assured. Cutslopes, ditchlines, and fill slopes would be stabilized where appropriate on roads that are to remain open for public or administrative use. Temporary spur roads would be restored to near original condition by methods such as scarification, revegetation with native species, and restoring the natural ground contour.

Watershed plans would be prepared in conjunction with and for the following community water systems where BLM administers a high portion of the watershed: city of Butte Falls, city of Yreka, city of Talent (Wagner Creek), and city of Glendale (Section and Mill creeks). Withdrawals from mineral activity would be pursued for these watersheds.

Watershed/riparian management plans would be prepared with the goal of restoring and/or maintaining water quality in the following priority watersheds: Jenny Creek, Pleasant Creek, West Fork Evans Creek, Lake Creek, Sugar Pine Creek, North Fork Big Butte Creek, South Fork Big Butte Creek, Camp Creek, Keene Creek, Lost Creek, Conde Creek, North Fork Silver Creek, North Fork Galice Creek, Rocky Gulch, Big Windy Creek, Jumpoff-Joe Creek, Williams Creek, South Fork Deer Creek, Sucker Creek, Althouse Creek, West Fork Cow Creek, and Snow Creek.

Land exchanges/acquisitions could be used to obtain key riparian-wetland areas or to block up BLM ownership within watersheds.

Approximately 1,100 miles of unsurfaced roads classified as local and without prior existing rights for others would be stabilized and closed to vehicular traffic during seasonal wet weather periods. Unsurfaced local roads remaining open would also be stabilized to maintain water quality. Gates and other types of traffic barriers would be used as appropriate.

Old Growth and Mature Forest

The lands managed as habitat conservation areas (HCA 1, 2, and 4s), according to the Interagency Scientific Committee's Conservation Strategy for the Northern Spotted Owl, would be available for retention, maintenance, and/or reestablishment of old growth and mature forest. Forestland in HCAs 1, 2, and 4s total 199,600 acres, of which 32,200 acres is old growth and 70,500 acres is mature forest.

Other forestland not available for timber harvest that would contribute to the retention, maintenance, and/or reestablishment of old growth and mature forest include: Rogue Wild and Scenic River, recreation sites, existing pockets of old growth, both adjacent to or accessible from recreation sites, RMAs, designated ACECs, wild and scenic rivers, and T&E and special status species habitat.

Total forestland acreage available for retention, maintenance, and/or reestablishment of old growth and mature forest is 321,300 acres, of which 47,400 acres is old growth and 104,100 acres is mature forest (see Tables 2-10 and S-1).

Timber

Lands Allocated to Timber Production

Under this alternative, 345,700 acres (62 percent of total) of suitable commercial forestland would be available for restricted forest management, including lands determined to be economically marginal under conventional even-aged management. Restrictions include those allocations related to VRM Class II management, rural interface areas (RIAs), and constraints necessary to retain 50 percent of the forest in stands with average diameters over 11 inches and average crown closure over 40 percent (50-11-40 guideline referenced in the Interagency Scientific Committee report).

Probable Sale Quantity

Projected 10-year acres for timber harvest and other timber management activities are shown in Table S-1. The estimated annual probable sale quantity (PSQ) for the expected 10-year life of the plan would be 12.9 mmcf (77 mmbf Scribner).

Table 2-13 displays the hardwood volume resulting from incidental harvest of hardwoods from conifer stands, stand conversion, and hardwood management.

Silvicultural Systems Utilized

Forestland allocated to timber management in this alternative would be managed under a combination of even-aged and shelterwood retention systems. These systems would be designed to produce the highest level of timber management consistent with retention of 50 percent of each quarter township in stands suitable to northern spotted owl dispersal. The appropriate silvicultural system would be selected based on specific site and stand characteristics and the combination of harvest practices which would meet the 50-11-40 criteria in each quarter township (see Alternative D, Special Status (Including Threatened and Endangered) Species Habitats, Northern Spotted Owl).

In addition to the features of these systems described in Appendix 2-T-1, Draft RMP, the following design features are used in this alternative.

- All surface-disturbing activities on granitic and pyroclastic soils would be seasonally restricted. No activity would be allowed between October 15 and May 15. Timber harvest practices would utilize shelterwood retention or structural retention systems to assure stability of these erodible soils. Broadcast burning would be done only when cool burns could be assured.

- Suitable commercial forestland allocated to timber management that is dominated by hardwoods, shrubs, or grass would be converted to conifer stands within the first decade. Hardwoods would be retained in the reestablished stand at a level consistent with identified target stand conditions.

- Only seasoned firewood would be sold to reduce potential air quality problems associated with the burning of green wood.

- On lands available for timber management, snags and unmerchantable cull trees and green merchantable trees would be retained to provide nest sites for 60 percent of optimum cavity nester populations, both for the present needs and over the long-term.

- Adequate existing and future sources for down logs and coarse woody debris on undisturbed sites would be reserved to retain wildlife habitat diversity and maintain long-term site productivity.

- After a transition period to complete stand maintenance on clearcuts created by past management, aerial application of herbicides would decline to a negligible level.

The following restrictions would apply within designated Category 1 and 2 HCAs.

- Timber harvest, timber salvage, or firewood sales would not be allowed.

- Silvicultural and fuels treatments (underburning, planting, fertilization, and precommercial thinning) would be utilized only to improve northern spotted owl habitat.

The following restrictions would apply within designated Category 4 HCAs.

- Timber harvest or other habitat removal would be prohibited within an 80-acre core area around each known nest site or center of activity for pairs and territorial single owls. This core area would retain the best quality and most contiguous habitat available.
- Firewood sales or timber salvage activities would not be allowed.

BLM-administered land within one-quarter mile of private land in identified RIAs (zoned for 1-20 acre lots) would be managed under VRM Class II objectives. Herbicide spraying, clearcutting, and prescribed burning would be prohibited.

Rotation lengths for this alternative would be set at 120 years.

Lands Not Allocated to Timber Production

No woodlands are allocated to timber production. Other lands unavailable for planned forest management include: recreation sites, existing patches of old growth adjacent to or accessible from recreation sites, riparian management areas, designated ACECs, wild river corridors, northern spotted owl habitat conservation areas (HCAs) and centers of activity (HCA 4s), and other T&E and special status species habitat.

Special Status (Including Threatened and Endangered) Species Habitat

In addition to protection of federally listed or proposed threatened or endangered species as discussed under Management Direction Common to All Alternatives, management and permitting actions would also be designed to protect habitats of Category 1 and 2 federal candidate, state listed, and Bureau-sensitive species on all BLM-administered land. Field surveys would be conducted for those species suspected to be present in an area proposed for a specific site-disturbing activity. If their presence is identified, their habitat would be protected. See Table 2-11 for a list of special status animal species and Table 3-SP-1 for a list of special status plant species known to occur in the planning area.

Lands would be acquired to facilitate protection and management of special status plant and animal species.

Plants

All special status plant species would have impacts mitigated, subject to rights under law and regulations. federal candidates, state listed, and Bureau-sensitive species would have a 200-foot buffer around each known site.

About 11,800 acres in the Illinois Valley would be designated a botanical emphasis area (BEA). This designation would highlight the exceptional botanical resources of this area and help assure mitigation of impacts to special status plant species.

Animals

Bald Eagle (Federal Threatened Species)

One block of at least 30 acres would be retained to provide for future population expansion within one-half mile of each of the following water bodies: Galesville Reservoir, Illinois River, Emigrant Lake, Hyatt Lake, Howard Prairie, and Lost Creek Reservoir. Within these blocks the habitat would be managed to retain old growth forest characteristics including large trees, snags, and at least 50 percent canopy closure. These blocks would be designated fire fuels management areas to reduce fuel loadings.

The core area around known bald eagle nest sites (approximately 10-70 acres) would be withdrawn from mineral entry.

Peregrine Falcon (Federal Endangered Species)

Potential nest cliffs would be managed to provide for future population expansion. The cliffs themselves would be protected and enhanced if necessary. No new road construction would be permitted within one-half mile of these potential nest sites unless the activity would not adversely affect the integrity of the site, and there would be no surface occupancy (NSO) for leasable minerals. These potential nest sites would be retained under BLM administration.

A core area within one-quarter mile of active nest sites would be withdrawn from mineral entry.

Northern Spotted Owl (Federal Threatened Species)

Northern spotted owl habitat conservation areas (HCAs) would be established as shown on the Alternative D map. HCA 1s and 2s are large areas, HCA 4s are 80-acre core areas. Timber harvest and other activities which would remove habitat would not be allowed in these areas, and other silvicultural activities (except stand regeneration) including firewood cutting, salvage logging, and clearing for mining would be prohibited. Prescribed fire, precommercial thinning, and fertilization could be used in stand regeneration. Road construction in HCAs would be allowed only where no feasible alternative exists. When roads are constructed in Category 1, 2, and 4 HCAs, they would be located and engineered to minimize loss and alteration of northern spotted owl habitat and would not be located within one-quarter mile of the activity center of any northern spotted owl pair.

Existing roads within Category 1 and 2 HCAs, except arterial and major collector roads, would be closed to motor vehicle use to minimize harassment, loss of habitat to theft, and risk of wildfire. Reforestation activities on cutover lands in HCAs would encourage a mix of species in the regenerating forest. All BLM-administered land within HCAs would be retained in federal ownership and other lands would be acquired to facilitate management. Site-specific habitat management plans (HMPs) would be developed for Category 1 and 2 HCAs.

Category 1 and 2 HCAs would be designated conditional fire suppression areas, fire use areas, and fire fuels reduction areas. Category 4 HCAs would be designated conditional fire suppression areas and fire fuels reduction areas.

On lands outside the HCAs, lands would be managed to maintain or attain owl dispersal habitat conditions where 50 percent of federal lands in each quarter township that have stands with at least 11 inch mean dbh and 40 percent canopy closure (50-11-40 rule). For on-the-ground management, clearcuts or other harvest systems might be used but no quarter township would be reduced below the 50-11-40 criteria or reduced further if they are already below the 50 percent level.

Human activities which could disturb owl nesting, especially use of large power equipment, would be prohibited within one-quarter mile of all active northern spotted owl nest sites from March 1 to September 30.

Road construction would take place only where no feasible alternative existed. If roads were to be constructed, they would be located and engineered to minimize loss and alteration of northern spotted owl habitat and would not be located within one-quarter mile of the activity center. Spur roads unneeded for continued timber management would be closed upon completion of logging and revegetated.

Townsend's Big-Eared Bat (Federal Candidate Species)

Approximately 30 acres around known colony caves would be protected. Within this area, dense forest conditions, if present, would be retained or restored where possible. No new road construction would be permitted, and human disturbance would be minimized. No surface occupancy (NSO) would be allowed and the area would be withdrawn from mineral entry. All BLM-administered land around known cave colonies would be retained in federal ownership. Caves and mine adits would be inventoried for bats.

Siskiyou Salamander and Del Norte Salamander (Federal Candidate Species)

Surface-disturbing activities would be avoided where feasible within 100 feet of talus habitat within the species range. Potential habitat would be inventoried for these species.

Jenny Creek Sucker and Redband Trout (Federal Candidate Species)

Timber harvest and other surface-disturbing activities would be prohibited within steep canyon areas along Jenny Creek and tributaries to protect habitat for the Jenny Creek sucker and redband trout.

Management direction discussed under Alternative D for Fisheries also applies to the above species.

Wildlife (Including Fisheries) Habitat

Wildlife

On lands allocated to timber management, the following would apply:

- Snags, live cull trees, and green merchantable trees would be retained to provide nest sites for a minimum of 60 percent of optimum cavity excavator populations, both for present needs and for sustainability over the long-term. This level generally corresponds to approximately 180 snags greater than 16 inches dbh per 100 acres of forested habitat.

- Coarse woody debris would be retained to provide approximately 1,100 tons per 100 acres, with at least 1,000 pieces greater than 16 inches in diameter and 12 feet long.

Raptors and Great Blue Heron

New nest sites, centers of activity, or rookeries would be identified and protected as necessary to maintain the integrity of the site. Human disturbances that could disturb or interfere with nesting would be prohibited within one-quarter mile of active nesting areas between approximately March 1 and July 15.

Roosevelt Elk

Within elk management areas the following objectives and restrictions would apply.

- Roads would be managed through use of gates and other types of road barricades to limit motorized vehicle use to an open road density of 1.5 miles per square mile where possible.

- Lands would be acquired to facilitate management of elk habitat.

- Only plant species indigenous to the area would be used when revegetating sites for erosion control, forage enhancement, timber production, or other purposes.

- Where consistent with northern spotted owl habitat objectives, timber harvests would be planned to provide at least the following target mix of habitats: 20 percent forage, 30 percent hiding cover, and 30 percent thermal and optimal cover. Permanent forage areas would be created and maintained where needed to help meet this target.

Special Habitats

Special habitats such as wetlands, meadows, and caves would receive 100-300 foot wide protective buffers (see Table 2-17).

Oak Stands

White oak woodlands would be managed to maintain or enhance values for wildlife habitat, range, botanical values, and biological diversity. These white oak woodlands would be designated as conditional fire suppressed areas and as fire use areas.

Golden Eagles

Approximately 30 acres would be protected around all known golden eagle nest sites. Within those areas there would be no timber harvest or other habitat removal. Human disturbances that would disturb or interfere with nesting would be prohibited between approximately March 1 and July 15. No new roads would be constructed within the 30-acre core area around active nests. These core areas would be designated as intensive fire suppression areas and fire use areas.

Fisheries

Except for land tenure zone 3 lands, riparian and fish habitat would be retained unless land exchanges would improve management of fish or riparian habitat elsewhere.

Coordinated activity management plans would be prepared for the following priority watersheds in conjunction with other agencies and private landowners. Plans would emphasize management of BLM special status and priority fish species and would be consistent with management direction for this alternative. The priority watersheds are:

Jenny Creek:	Jenny Creek sucker, redband trout
West Evans Creek:	Summer and winter steelhead, coho salmon
Illinois River:	Winter steelhead, coho salmon
Cow Creek:	Winter steelhead, coho salmon

BLM ownership in the watersheds shown on Table 2-18 would be blocked up to improve watershed management for:

- Federal candidate fish and amphibian species (Jenny Creek sucker, redband trout, and western pond turtle),

- State of Oregon and American Fisheries Society sensitive fish species (coho salmon, winter and summer steelhead), and

- To help prevent decline of other priority fish species in other watersheds.

BLM ownership in these watersheds is at least 50 percent.

Seasonal restrictions on road construction could be required on granitic and pyroclastic soil areas to protect water quality and reduce surface erosion. Where necessary and practical, appropriate methods would be used to stabilize cutslopes, ditchlines, and fill slopes on all existing road systems in fragile soils (e.g., West Evans and Upper Lake creeks) that are to remain open for public or administrative use. Temporary spur roads would be restored to near original condition by methods such as scarifying the road bed, planting tree seedlings or grass, restoring the natural ground contour, and water barring.

Special Areas

All three existing ACECs (2,577 acres), two RNAs (670 acres), and three EEAs (30 acres) would be retained as special areas. Additionally, 14 new ACECs (102,800 acres) and 7 new RNAs (5,994 acres) would be designated as special areas (see Table 2-12).

Grayback Glades and North Fork Silver Creek would have a 100-foot buffer to minimize effects within the RNAs from disturbance adjacent to their boundaries.

Recreation

Six areas would be designated and managed as special recreation management areas (SRMA). Sixty new potential recreation sites and 16 new potential trails would be managed to maintain their potential for development. These potential sites and trails would be developed as funding and opportunity exists. Five new back country byways (BCBW) would be designated. See Table 2-4 for comparison of developed sites, trails, SRMAs, and BCBWs that would be managed or maintained by alternative.

Mineral withdrawals would be pursued for Lower Galice Creek (downstream from the North Fork of Mill Creek) and Agate Flat to provide opportunities for recreational gold panning, dredging, and rock collecting.

About 56,000 acres would be closed to off-highway vehicle (OHV) use. On the remainder of the planning area, about 811,500 acres, OHV use would be limited to existing roads. See Table 2-15 for potential OHV designation by alternative.

Wild and Scenic Rivers

Two and four tenths (2.4) miles of Whiskey Creek from its confluence with the Rogue River to the east and west forks would be found suitable for designation as a wild component in the National Wild and Scenic Rivers System (see Table 2-18).

Visual Resources

Land within one-quarter mile of designated rural interface area categories of 1-20 acres would be managed to meet VRM Class II management objectives. All other lands would be managed as inventoried. See Table S-1 for acres of each VRM Class by alternative.

Wilderness

If not designated wilderness, the Soda Mountain WSA (5,867 acres) would be managed as part of the Siskiyou Mountain ACEC (20,000 acres), and the Brewer Spruce ISA (429 acres) would be enlarged to 1,240 acres and managed as an ACEC/RNA.

Land Tenure Adjustments

Exchange of BLM-administered land would be made to benefit one or more of the resources managed.

Sale of land other than available commercial forestland would be made to dispose of lands that meets the following criteria (1) or (2) of FLPMA, Section 203(a):

(1) Such tract, because of its location or other characteristics, is difficult or uneconomical to manage as part of the public lands and is not suitable for management by another federal department or agency; or

(2) Such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose.

No commercial forestland would be leased. Leases or conveyance of land, other than commercial forestland in zones 2 and 3, would be made only under the Recreation and Public Purposes Act.

Rural Interface Areas

Resource management activities would be altered where feasible on 137,500 acres of BLM-administered land within one-quarter mile of private land in identified RIAs (zoned for 1-20 acre lots) to mitigate adjacent neighbors' concerns. These lands would also be managed under VRM Class II objectives. Herbicide spraying, prescribed burning, and clearcutting would be prohibited (see Tables 2-16 and S-1).

No new quarries would be developed in managed RIA zones.

Manage and design road systems to reduce public health and safety hazards, fire risks, and vandalism to public and private property. Of particular concern is unauthorized public use of nonthrough or "local" roads within rural interface areas and within one-quarter mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate.

Alternative E

Water Quality and Riparian Zones

General management objectives for streams and riparian management areas (RMAs) are listed below.

- Water Quality: Meet or exceed state water quality standards.
- Stream Ecosystem: Maintain or improve the biological, chemical, and physical functions of the stream ecosystem. (Coarse woody debris is a major component of stream ecosystems, controlling the distribution of aquatic habitats, providing habitat and food source for invertebrates and amphibians, spawning and rearing habitat for fish, stability of streambeds and streambanks, and routing of sediments and water through the stream ecosystem.)
- Riparian Ecosystem: Maintain or improve riparian habitat for wildlife and native plant diversity.

Actual RMA widths would be determined using the widths shown in Table 2-1 in conjunction with on-the-ground stream characteristics, riparian vegetation, soil, and topography to meet specific management objectives listed by stream type (see Table 2-20).

Fragile nonsuitable woodlands would not be available for timber harvest, and other surface disturbing activities would be prohibited unless adequately mitigated to maintain site productivity and protect water quality.

No planned timber harvest or other surface-disturbing activities would be allowed on approximately 48,100 acres of lands dominated by fragile granitic and schist soils to protect water quality and site productivity. These soils are scattered throughout the planning area, however, the largest concentrations of soils formed from decomposed schist and/or granitic parent material occur in Evans, Snow, Sugar, and Meadow creeks, upper portions of Williams Creek, and headwaters of Birdseye Creek.

No planned timber harvest or surface-disturbing activities would be allowed on approximately 52,900 acres of steeply sloping (60 percent or greater slope gradient) lands to reduce incidents of soil erosion and landslides. These lands are predominately in the lower Rogue River canyon and in the lower canyon areas of tributaries to the lower Rogue River. A limited amount of the steeply sloping lands occur in the Cascades (Trail and Elk creeks), and the remainder is scattered throughout the western half of the planning area.

Surface-disturbing activities would be limited on all lands dominated by fragile pyroclastic soils (approximately 37,200 acres) to minimize losses to site productivity, reduce soil erosion, and minimize water quality degradation. Soils formed in deeply weathered pyroclastic parent materials are predominantly found in the foothills of the Cascades. Restrictions to meet the objectives could include, but are not limited to, no facility construction, shelterwood retention harvest system, minimal impact road construction and rights-of-way disturbance, no tractor yarding, and seasonal restrictions on surface disturbing activities. Cutslopes, ditchlines, and fill slopes would be stabilized where appropriate on roads that are to remain open for public or administrative use. Temporary spur roads would be restored to near original condition by methods such as scarification, revegetation with native species, and restoring the natural ground contour.

Watershed plans would be prepared in conjunction with and for the following community water systems where BLM administers a high portion of the watershed: city of Butte Falls, city of Yreka, city of Talent (Wagner Creek), and city of Glendale (Section and Mill creeks). Withdrawals from mineral activity would be pursued for these watersheds.

Watershed/riparian plans would be prepared with the goal of restoring and maintaining water quality in the following priority watersheds: Jenny Creek, Pleasant Creek, West Fork Evans Creek, Lake Creek, Sugar Pine Creek, North Fork Big Butte Creek, South Fork Big Butte Creek, Camp Creek, Keene Creek, Lost Creek, Conde Creek, North Fork Silver Creek, North Fork Galice Creek, Rocky Gulch, Big Windy Creek, Jumpoff Joe Creek, Williams Creek, South Fork Deer

Creek, Sucker Creek, Althouse Creek, West Fork Cow Creek, Snow Creek, West Fork Elk Creek, North and South Forks Lost Creek, East Fork Evans Creek, Trail Creek, Grave Creek, Ditch Creek, Sykes Creek, May Creek, Rock Creek, Salt Creek, Fielder Creek, Sardine Creek, Kelly Slough, Denman Reserve, and Blue Goose Spring.

Land exchanges/acquisitions could be used to obtain key riparian-wetland areas or to block up BLM ownership within watersheds.

Approximately 1,100 miles of unsurfaced roads classified as local and without prior existing rights for others would be stabilized and closed to vehicular traffic during seasonal wet weather periods. Unsurfaced local roads remaining open would also be stabilized to maintain water quality. Gates and other types of traffic barriers would be used as appropriate.

Old Growth and Mature Forest

Forest stands over 150 years old would be managed for the retention, maintenance, and/or reestablishment of old growth and mature forest. Forestland within 400 feet of these stands older than 150 years would not be subject to planned harvest to assist in maintaining natural ecological elements, protect the older stands from edge effect and natural disaster, and interconnect them into a sustainable network. These forestlands total approximately 248,600 acres, of which 101,500 acres is currently old growth and 94,800 acres is mature forests. In addition, forestland lying within approximately two miles of northern spotted owl nests or habitat cores occupied in recent years would be protected. A 40-acre block in each section where BLM administers at least half of the land would be protected to provide habitat for amphibians and nesting goshawks and pileated woodpeckers.

Other forestlands not available for timber harvest that would contribute to the retention, maintenance, and/or reestablishment of old growth and mature forest include Rogue Wild and Scenic River, recreation sites, existing pockets of old growth adjacent to or accessible from recreation sites, site Class 5 lands, VRM Class I lands, wild & scenic river corridors, RMAs, ACECs, special status species and other priority species habitat, lands inventoried under timber production capability classification (TPCC) as fragile gradient-restricted, and granitic and pyroclastic soils.

The total forestland available for or allocated to retention, maintenance, and/or reestablishment of old growth and mature forest is 593,500 acres, of which 101,900 acres is currently old growth and 202,600 acres is mature forest (see Tables 2-10 and S-1).

Timber

Lands Allocated to Timber Production

Under this alternative, 7,500 (1 percent of total) of suitable commercial forestland would be available for intensive forest management, and 66,000 acres (12 percent of total) would be available for restricted forest management. Restrictions include those related to VRM Class II and rural interface area (RIA) allocations.

Probable Sale Quantity

Projected 10-year acres for timber harvest and other timber management activities are shown in Table S-1. The estimated annual timber sale quantity for the expected 10-year life of the plan would be 5.2 mmcf (31 mmbf Scribner).

Table 2-13 displays the hardwood volume resulting from incidental harvest of hardwoods from conifer stands, stand conversion, and hardwood management.

Silvicultural Systems Utilized

Lands allocated to timber management in this alternative would be managed with even-aged or shelterwood retention systems. In addition to the features of these systems described in Appendix 2-T-1, Draft RMP, the following design features are used in this alternative.

- Suitable and available forestland dominated by hardwoods, shrubs, or grass would be converted to conifer stands within the first decade. Hardwoods would be retained in the reestablished stand at a level consistent with identified target stand conditions.
- Only seasoned firewood would be sold to reduce potential air quality problems associated with the burning of green wood.
- Adequate existing and future sources for down logs and coarse woody debris on undisturbed sites would be reserved to retain wildlife habitat diversity and maintain long-term site productivity.

- There would be no herbicide spraying, no clearcutting, and no prescribed burning on BLM-administered land within one-half mile of private land in RIAs zoned for 1-20 acre lots.

- Minimum harvest age for this alternative is not constrained for even-aged stands but is set at 100 years of age for shelterwood retention stands.

- After a transition period to complete stand maintenance on clearcuts created by past management, aerial application of herbicides would decline to a negligible level.

- Spur roads unneeded for continued timber management would be closed upon completion of logging and replanted.

Lands Not Allocated to Timber Production

No woodland or economically marginal lands would be allocated to timber production. Other lands not available for forest management include: all site Class 5 lands or lower quality; all forest stands greater than 150 years in age; forestland within 400 feet of stands greater than 150 years in age; all forestland classified as suitable owl habitat within two miles of each northern spotted owl center of activity; VRM Class I lands; recreation sites; existing pockets of old growth adjacent to or accessible from recreation sites; RMAs; wild & scenic rivers; special status species and other priority species habitat, including old growth stands in headwater streams for amphibians, pileated woodpeckers and goshawk habitat; lands inventoried under TPCC as fragile gradient-restricted; and granitic soils (see Table S-1).

Special Status (Including Threatened and Endangered) Species Habitat

The habitat of all threatened and endangered species, species with high potential for listing, and species of related concern would be protected.

In addition to protection of federally listed or proposed threatened or endangered species, BLM management and permitting actions would also be designed to protect habitats of Category 1 and 2 federal candidate, state listed, and Bureau-sensitive species. Field surveys would be conducted in an area proposed for a specific surface-disturbing activity focusing on these species. If their presence is identified, their habitat would be protected. See Table 2-11 for a list of special animal status species and Table 3-SP-1 for a list of special status plants known to exist in the planning area.

Lands would be acquired to facilitate protection and management of special status plant and animal species.

Plants

Federal candidates, state listed, and Bureau-sensitive plant species would have a 300-foot buffer around each known site. About 11,800 acres in the Illinois Valley would be designated a botanical emphasis area (BEA). This designation would highlight the exceptional botanical resources of this area and help assure mitigation of impacts to special status plant species.

Animals

Bald Eagle (Federal Threatened Species)

One block of at least 30 acres would be managed for nesting habitat to provide for future population expansion within one-half mile of each of the following water bodies: Galesville Reservoir, Illinois River, Emigrant Lake, Hyatt Lake, Howard Prairie, and Lost Creek Reservoir. Within these blocks the habitat would be managed to retain requisite forest habitat characteristics including large trees, snags, and at least 50 percent canopy closure. These blocks would be designated fire fuels management areas to reduce fuel loadings. There would be no timber harvest except to benefit bald eagle nest habitat, no new road construction, and no surface occupancy (NSO) for leasable minerals.

The core area around known bald eagle nest sites (approximately 10-70 acres) would be withdrawn from mineral entry.

Peregrine Falcon (Federal Endangered Species)

Potential nest cliffs would be managed to provide for future population expansion. The cliffs themselves would be protected and enhanced if necessary. No new road construction would be permitted within one-half mile of these potential nest sites unless the activity would not adversely affect the integrity of the site, and there would be no surface occupancy (NSO) for leasable minerals. These potential nest sites would be retained under BLM administration.

A core area within one-quarter mile of active nest sites could be withdrawn from mineral entry.

Northern Spotted Owl (Federal Threatened Species)

All stands over 150 years old would be protected and would be available for northern spotted owl habitat. Within two miles of each northern spotted owl pair or resident single, all suitable habitat would be protected. In addition, younger forests within one mile of these sites would also be protected to provide more contiguous habitat in the future.

Human activities which may disturb owl nesting, especially use of large power equipment, would be prohibited within one-quarter mile of all active northern spotted owl nest sites from March 1 to September 30. Spur roads needed for continued timber management would be closed upon completion of logging and revegetated.

Townsend's Big-Eared Bat (Federal Candidate Species)

Approximately 30 acres around known colony caves would be protected. Within this area, dense forest conditions, if present, would be retained or restored where possible. No new road construction would be permitted, and human disturbance would be minimized. NSO would be allowed and the area would be withdrawn from mineral entry. All BLM-administered land around known cave colonies would be retained in federal ownership. Caves and mine adits would be inventoried for bats.

Siskiyou Salamander and Del Norte Salamander (Federal Candidate Species)

Surface disturbing activities would be avoided where feasible within 100 feet of talus habitat within the species range. Potential habitat would be inventoried for these species.

Northern Goshawk (Federal Candidate Species)

Where BLM administers at least 300 acres per section, a 40-acre block of the oldest stands available would be reserved as goshawk nesting core areas. These blocks would also serve as habitat areas for amphibians, pileated woodpeckers, and other species, Jenny Creek Sucker (Federal Candidate Species), Redband Trout (Federal Candidate Species), Coho Salmon (assessment species, Rogue River basin), Summer Steelhead (American Fisheries Society, proposed threatened species, Rogue River basin) and Winter Steelhead (American Fisheries Society, proposed threatened species, Illinois River basin)

New road construction, including swing roads and tractor skid trails, would be minimized in watersheds inhabited by these species. This includes the Jenny Creek basin and all of the Rogue River basin including the Applegate and Illinois River watersheds.

Surface-disturbing activities within the above watersheds would be designed so they do not degrade habitat for the above-listed species.

Timber harvest and other surface-disturbing activities within steep canyon areas along Jenny Creek and tributaries would be prohibited to protect habitat for the Jenny Creek sucker and redband trout.

Management direction discussed under Alternative E for Fisheries also applies to the above species.

Wildlife (Including Fisheries) Habitat

Wildlife

On lands allocated to timber management, the following would apply.

- Snags, live cull trees, and green merchantable trees would be retained to provide nest sites for a minimum of 60 percent of optimum cavity excavator populations, both for present needs and for sustainability over the long-term. This level generally corresponds to approximately 180 snags greater than 16 inches dbh per 100 acres of forested habitat.

- In addition, approximately 20 percent of each harvest unit would be retained for cavity nester habitat in patches of at least two acres.

- In each section where BLM administers at least half of the section, a 40-acre block of the oldest stands available would be reserved for pileated woodpecker nesting habitat. These blocks would also serve as habitat areas for goshawks, amphibians, and other species.

- Coarse woody debris would be retained to provide approximately 1,400 tons per 100 acres, with at least 1,300 pieces greater than 16 inches diameter and 12 feet long.

Throughout the planning area roads would be managed through use of gates and other types of road barricades to limit motorized vehicle use to an open road density of 1.5 miles per square mile where possible.

Throughout the planning area land would be acquired to facilitate wildlife habitat management.

Raptors and Great Blue Heron

New nest sites, centers of activity, or rookeries would be identified and protected as necessary to maintain the integrity of the site. Human disturbances that may disturb or interfere with nesting would be prohibited within one-quarter of active nesting areas between approximately March 1 and July 15.

Accipiter Hawks

At least 20 percent of all late seral stage stands (41-100 years old) would be maintained in an unthinned condition to provide dense nesting habitat. In addition, in each section where BLM owns at least half of the section, a 40-acre block of the oldest stands remaining would be reserved for goshawk nesting habitat. These blocks would also serve as habitat areas for pileated woodpeckers, amphibians, and other wildlife species.

New nest sites, centers of activity, or rookeries would be identified and protected as necessary to maintain the integrity of the site. Human disturbances which would disturb or interfere with nesting would be prohibited within one-quarter of active nesting areas between approximately March 1 and July 15.

Roosevelt Elk and Black-tailed Deer

Within big game management areas the following objectives and restrictions would apply.

- Big game forage quality would be optimized in regeneration harvest units. In addition, permanent forage areas would be created and maintained on lands not allocated to intensive or restricted timber harvest.
- Timber harvesting would be prohibited within the designated big game winter range areas in the Cascade foothills except to enhance big game habitat (see Alternative E map).
- All BLM-administered land would be retained in federal ownership.
- Off-highway vehicle (OHV) use would be restricted within crucial winter range areas in the Butte Falls and Ashland resource areas between approximately November 15 and April 1.
- A target of 10 percent of the summer range would be retained in thermal cover within the Dead Indian area of the Cascade Mountains.

Special Habitats

Special habitats such as wetlands, meadows, and caves would receive 100 to 300-foot wide protective buffers (see Table 2-17).

Oak Stands

White oak woodlands would be managed to maintain or enhance values for wildlife habitat, range, botanical values, and biological diversity. These white oak woodlands would be designated as conditional fire suppression areas and as fire use areas.

Golden Eagles

Approximately 30 acres would be protected around all known golden eagle nest sites. Within these areas there would be no timber harvest or other habitat removal. Human disturbances that may disturb or interfere with nesting would be prohibited between March 1 and July 15.

No new roads would be constructed within the 30-acre core area around active nests.

Amphibians

Where BLM administers at least 300 acres per section, a 40-acre block of the oldest stands available would be reserved as amphibian habitat. These blocks would also serve as habitat areas for pileated woodpeckers, goshawks, and other wildlife species.

Fisheries

Except for land tenure zone 3 lands, riparian and fish habitat would be retained unless land exchanges would improve management of fish, wildlife, or riparian habitat elsewhere.

No new surface-disturbing activities would be allowed on areas with decomposed granitic and schist soils unless project design features can effectively protect water quality, prevent surface erosion, and protect fisheries habitat.

Coordinated activity management plans would be prepared for the following priority watersheds in conjunction with other agencies and private landowners. Plans would emphasize management of BLM special status and priority fish species and would be consistent with management direction for this alternative. The priority watersheds are:

Jenny Creek:	Jenny Creek sucker, redband trout
West Evans Creek:	Summer and winter steelhead, coho salmon
Illinois River:	Winter steelhead, coho salmon
Cow Creek:	Winter steelhead, coho salmon

BLM ownership in the watersheds shown on Table 2-18 would be blocked up to improve watershed management for:

- Federal candidate fish and amphibian species (Jenny Creek sucker, redband trout, and western pond turtle);
- State of Oregon and American Fisheries Society sensitive fish species (coho salmon, winter and summer steelhead); and
- To help prevent decline of other priority fish species in other watersheds.

BLM ownership in these watersheds is at least 50 percent.

New road construction would be minimized on granitic and pyroclastic soil areas to protect water quality and reduce surface erosion. Where necessary and practical, appropriate methods would be used to stabilize cutslopes, ditchlines, and fill slopes on all existing road systems in fragile soils (e.g., West Evans and Upper Lake creeks) that are to remain open for public or administrative use. Temporary spur roads would be restored to near original condition by methods such as scarifying the road bed, planting tree seedlings or grass, restoring the natural ground contour, and water barring.

Special Areas

All three existing ACECs (2,577 acres), two RNAs (670 acres), and three EEAs (30 acres) would be retained as special areas. Additionally, twenty-four new ACECs (127,800 acres) and ten new RNAs (8,424 acres) would be designated as special areas (see Table 2-12).

Grayback Glades and North Fork Silver Creek would have a 100-foot buffer to minimize effects within the RNAs from disturbance adjacent to their boundaries.

Recreation

Seven areas would be designated and managed as special recreation management areas (SRMA). Sixty new potential recreation sites and 16 new potential trails would be managed to maintain their potential for development. These potential sites and trails would be developed as funding and opportunity exists. Seven new back country byways would be designated. See Table 2-4 for comparison of developed sites, trails, SRMAs, and BCBWs that would be managed or maintained by alternative.

Mineral withdrawals would be pursued for Lower Galice Creek (downstream from the North Fork of Mill Creek) and Agate Flat to provide opportunities for recreational gold panning, dredging, and rock collecting.

About 32,200 acres would be closed to OHV use. On the remainder of the planning area, about 835,300 acres, OHV use would be limited to designated roads. See Table 2-15 for potential OHV designation by alternative.

Wild and Scenic Rivers

All rivers found eligible and where BLM administers at least 40 percent of the land base (plus Jenny Creek) would be found suitable for inclusion in the National Wild and Scenic Rivers System. This includes 12 river segments comprising 70.3 miles found suitable for potential recreation designation, 1 segment covering 17.6 miles for scenic, and 35 segments covering 102.4 miles for potential wild designation (see Table 2-19).

Visual Resources

VRM Class I management would be provided to all lands designated by Congress for special protection plus all BLM-administered land within one-quarter mile of developed recreation sites, state and federal highways, state scenic waterways, and rivers designated under the federal Wild and Scenic Rivers Act. All land inventoried as VRM Class II as well as land within one-half mile of designated RIA categories of 1-20 acres would be managed as VRM Class II. Land inventoried as VRM Class III or IV would be managed as Class III. See Table S-1 for acres of each VRM Class by alternative.

Wilderness

If not designated wilderness, the Soda Mountain WSA (5,867 acres) would be managed as part of the Siskiyou Mountain ACEC (20,000 acres) and the Brewer Spruce ISA (429 acres) would be enlarged to 1,240 acres and managed as an ACEC/RNA.

Land Tenure Adjustments

Exchange of BLM-administered land would be made to benefit one or more of the resources managed.

Sale of land other than available commercial forestland would be made to dispose of lands that meets the following criteria (1) or (2) of FLPMA, Section 203(a):

(1) Such tract, because of its location or other characteristics, is difficult or uneconomical to manage as part of the public lands and is not suitable for management by another federal department or agency; or

(2) Such tract was acquired for a specific purpose and the tract is no longer required for that or any other federal purpose.

No commercial forestland would be leased. Leases or conveyance of land, other than commercial forestland in zones 2 and 3, would be made only under the Recreation and Public Purposes Act.

Rural Interface Areas

Resource management activities would be altered where feasible on 235,000 acres of BLM-administered land within one-quarter mile of private land in identified RIAs (zoned for 1-20 acre lots) to mitigate adjacent neighbors' concerns. These lands would also be managed under VRM Class II objectives. Herbicide spraying, clearcutting, and the use of prescribed fire for timber management would be prohibited (see Tables 2-16 and S-1).

RIAs would be available for oil, gas, and geothermal leasing with a NSO or surface disturbance stipulation.

All existing quarries within RIA zones would be closed and reclaimed, and no new quarries would be developed for any purpose.

Manage and design road systems to reduce public health and safety hazards, fire risks, and vandalism to public and private property. Of particular concern is unauthorized public use of nonthrough or "local" roads within rural interface areas and within one-quarter mile of existing dwellings. Gates and other types of traffic barriers such as guardrails, berms, ditches, and log barricades will be used as appropriate.

NOTE: This is the end of the description of alternatives. The following sections apply to all alternatives, but were written specifically for the PRMP. They should be read to develop a complete understanding of the alternatives.

Coordination and Consultation

The implementation of this RMP and the overriding SEIS ROD calls for a high level of coordination and cooperation among agencies. A formal procedure for interagency coordination has been created by a Memorandum of Understanding for Forest Ecosystem Management that has been entered into by the White House Office on Environmental Policy, the Department of the Interior, the Department of Agriculture, the Department of Commerce, and the Environmental Protection Agency. The Memorandum of Understanding created several interagency groups, including the Interagency Steering Committee, Regional Interagency Executive Committee, and Regional Ecosystem Office. A detailed description of these groups is included in Attachment A, Section E, Implementation, of the SEIS ROD.

Consultation under the Endangered Species Act will emphasize an integrated ecosystem approach. This will include involving the Fish and Wildlife Service and the National Marine Fisheries Service in all relevant implementation planning, so their views can be made known. For covered species, actions proposed to implement this RMP will undergo consultation, either formal or informal, as appropriate. Consultation for the northern spotted owl on activities that are consistent with the standards and guidelines of the SEIS ROD and that would not result in "take" of a listed species is expected to be informal. If take would result, incidental take statements may be provided through formal consultation.

Concurrent coordination with the Environmental Protection Agency (EPA) and Oregon Department of

Environmental Quality (DEQ) on water quality standards and beneficial use requirements of the Clean Water Act will minimize project impacts. Similar coordination with the EPA, DEQ and U.S. Forest Service on minimizing impacts of emissions from prescribed burning will occur.

Use of the Completed Plan

Many of the management activities described in this RMP/EIS can be accomplished through contracts and permits. Performance standards are developed and included in a contract or permit. They require the contractor or permittee to comply with applicable laws, regulations, policies and plans. Selection of performance standards is governed by the scope of the action to be undertaken and the physical characteristics of the specific site. The standards, which include design features and mitigating measures, must be followed in carrying out an action.

Site-specific planning by interdisciplinary teams (IDTs) will precede most on-the-ground management activities. Interdisciplinary teams are comprised of relevant resource management disciplines. The IDT process includes, as appropriate, field examination of resources, selection of alternative management actions, analysis of alternatives, and documentation to meet National Environmental Policy Act requirements. Adjacent land uses will be considered during site-specific land management planning.

In addition to being routinely monitored, the RMP will be formally evaluated at the end of every third year after implementation begins, until such time as preparation of new plans, that would supersede the RMP over a substantial majority of its area, is well under way. The reason for the formal evaluation is to determine whether there is significant cause for an amendment or revision of the plan. Evaluation includes a cumulative analysis of monitoring records, with the broader purpose of determining if the plan's goals and objectives are being or are likely to be met, and whether the goals and objectives were realistic and achievable in the first place.

Evaluation will also assess whether changed circumstances (such as changes in the plans of other government agencies or Indian tribes) or new information so altered the levels or methods of activities or the expected impacts (on water, wildlife, socioeconomic conditions, etc.), that the environmental consequences of the plan may paint a seriously different picture than those anticipated in the PRMP/FEIS.

As part of these third year evaluations, the allowable sale quantity will be reevaluated, to incorporate the results of watershed analyses; monitoring; further inventory; and site-specific, watershed-specific or province-level decisions.

If an evaluation concludes that the plan's goals are not achievable, a plan amendment or revision will be initiated. If the evaluation concludes that land use allocations or management direction needs to be modified, a plan amendment or revision may be appropriate. An analysis will address the need for either. If the analysis determines that amending the plan is appropriate, the amendment process set forth in 43 CFR 1610.5-5 or 1610.5-6 would be followed. If amendment is not appropriate, NEPA procedures will still be followed before the modification is approved, along with coordination through the Regional Ecosystem Office and the Regional Interagency Executive Committee if FSEIS ROD standards and guidelines or land-use allocations would be modified. Figure 2-2 (see FSEIS ROD) shows how monitoring and/or evaluation could lead to a revision of management direction or other changes in the RMP.

No additional evaluations of this type will be done unless some changed circumstance or unusual event causes the continuing validity of the plan to be questioned. Following completion of each plan evaluation, a summary of its findings will be included in the district's annual program summary.

In future years, after preparation of new plans that would substantially supersede the RMP is well under way, if some circumstances change or unusual events occur of a magnitude that question BLM's ability to meet some of the remaining plan objectives, interim management adjustments may be made to meet those objectives, without a plan amendment. The kind of circumstance which could lead to such an adjustment might be an announcement of research findings which clearly establish that some of the plan's goals and objectives are unlikely to be met. The kind of unusual event which could lead to such an adjustment might be a major catastrophe such as a wildfire or windstorm causing extensive damage to forest stands. Similar interim adjustments can be made at any time during the life of the plan, pending evaluation and possible plan amendment.

Adaptive Management

Adaptive management is a continuing process of action-based monitoring, researching, evaluating and adjusting with the objective of improving the implementation and achieving the goals of the RMP. This approach to evaluation and interim adjustment will frame a process of adaptive management, permitting effective response to changing knowledge. The RMP is based on current scientific knowledge. To be successful, it must have the flexibility to adapt and respond to new information. Under the concept of adaptive management, new information will be evaluated and a decision will be made whether to make adjustments or changes. The adaptive management approach will enable resource managers to determine how well management actions meet their objectives and what steps are needed to modify activities to increase success or improve results.

The adaptive management process will be implemented to maximize the benefits and efficiency of the RMP. This may result in the refinement of management direction or land-use allocations which may require amendment of the RMP. Adaptive management decisions may vary in scale from individual watersheds, specific forest types, physiographic provinces, or the entire planning area. Many adaptive management modifications may not require formal changes to the RMP.

The model displayed in Figure 2-2 (see SEIS ROD) identifies the various steps, activities, and outline of a procedure for the adaptive management process. This diagram conveys the general concept, and is valuable as a starting point, for understanding adaptive management. A full and detailed explanation of the model, which is beyond the scope of this discussion, would require that each step be further broken down and defined.

New information that could direct an adjustment of strategy may come from monitoring, research, statutory or regulatory changes, organizational or process assessments, or any number of additional sources. During the evaluation process the information will be analyzed to determine the nature, scope, and importance of the new information.

Adaptive management could entail modification of silvicultural prescriptions to respond to increasing knowledge providing greater certainty about anticipated climate change or to respond to increasing knowledge about the habitat needs of northern spotted owls, to cite examples that could have widespread application. Adaptive management could equally entail modification of rather localized management practices to respond to the results of monitoring.

Any potential new management actions identified after RMP/ROD approval will be analyzed before BLM moves to implement them. For example, if a new ACEC proposal meets BLM criteria for consideration, the District Manager may prescribe interim management measures for the remaining life of the plan. Such interim management must meet the objectives of the RMP, except where inconsistent with the regulations regarding potential ACECs, and would be subject to analysis in an EIS or Environmental Assessment linked to a proposed plan amendment or a broader plan revision.

Watershed Analysis

Watershed analysis is one of the principal analyses that will be used to meet the ecosystem management objectives of this RMP. Watershed analyses will be a mechanism to support ecosystem management at approximately the 20 to 200 square mile watershed level. Watershed analysis, as described here, focuses on its broad role in implementing the ecosystem management objectives prescribed by these standards and guidelines. The use of watershed analysis, as described in the Aquatic Conservation Strategy (see Appendix E), is a more narrow focus and is just one aspect of its role. While not required by the ROD on the SEIS or this document, it is assumed that watershed analysis will eventually be completed for the entire planning area. Watershed analysis will help guide implementation of the RMP in many important aspects.

Watershed analysis will focus on collecting and compiling information within the watershed that is essential for making sound management decisions. It will be an analytical process, not a decision-making process with a proposed action requiring NEPA documentation. It will serve as the basis for developing project-specific proposals, and determining monitoring and restoration needs for a watershed. Some analysis of issues or resources may be included in broader scale analyses because of their scope. The information from the watershed analyses will contribute to decision making at all levels. Project-specific NEPA planning will use information developed from watershed analysis. For example, if watershed analysis shows that restoring certain resources within a watershed could contribute to achieving landscape or ecosystem management objectives, then subsequent decisions will need to address that information.

The results of watershed analyses may include a description of the resource needs, issues, the range of natural variability, spatially explicit information that will facilitate environmental and cumulative effects analyses to comply with NEPA regulations, and the processes and functions operating within the watershed. Watershed analysis will identify potentially disjunct approaches and conflicting objectives within watersheds. The information from watershed analysis will be used to develop priorities for funding and implementing actions and projects, and will be used to develop monitoring strategies and objectives. The participation in watershed analysis of adjacent landowners, private citizens, interest groups, industry, government agencies, and others will be encouraged.

Watershed analysis will be an ongoing, iterative process that will help define important resource and information needs. As watershed analysis is further developed and refined, it will describe the processes and interactions for all applicable resources. It will be an information-gathering and analysis process, but will not be a comprehensive inventory process. It will build on information collected from detailed, site-specific analyses. Information gathering and analysis will be related to management needs, and not be performed for their own sake. While generally watershed analysis will be used to organize, collate, and describe existing information, there may be critical information needs that must be met before completing the analysis. In those instances, the additional information will be collected before completing the watershed analysis. In other instances, information needs may be identified that are not required for completing the watershed analysis but should be met for subsequent analyses, planning, or decisions.

Watershed analysis is a technically rigorous procedure with the purpose of developing and documenting a scientifically-based understanding of the ecological structures, functions, processes and interactions occurring within a watershed. The scope of the analysis for implementing the ecosystem management objectives of these standards and guidelines may include all aspects of the ecosystem. Some of these aspects include beneficial uses; vegetative patterns and distribution; flow phenomena such as vegetation corridors, streams, and riparian corridors; wind; fire (wild and prescribed fire, and fire suppression); wildlife migration routes; dispersal habitat; terrestrial vertebrate distribution; locally significant habitats; human use patterns throughout the ecosystem; cumulative effects; and hydrology. The number and detail of these aspects considered will depend on the issues pertaining to a given watershed.

In the initial years of implementation, the process for watershed analysis is expected to evolve to meet long-term objectives. However, some projects proposed for the first few years of implementation are in areas that require watershed analysis prior to approval of the projects (i.e., key watersheds and riparian reserves). In Fiscal Years 1995-96, watershed analysis done for these projects may be less detailed than analyses that are completed in later years. Regardless, analysis done during the initial years (Fiscal Years 1995-96) will comply with the following guidance:

- The goal of the analysis is to determine whether the proposed actions are consistent with the objectives, land-use allocations and management direction of the RMP.
- Existing information will be used to the greatest extent possible, with new information collected, to the maximum extent practicable, to fill crucial data gaps.
- Analysis will address the entire watershed, even though some areas may be analyzed at a lower level of precision, and the analysis of issues may be prioritized.
- Information from the analysis will flow into the NEPA documentation for specific projects, and will be used where practicable to facilitate Endangered Species Act and Clean Water Act compliance.
- Restoration opportunities will be identified.

A portion of the Applegate River drainage has been designated a pilot watershed analysis program to develop and test an effective long-term process. A scientifically peer-reviewed Watershed Analysis Guide will be finalized based on experiences gained in the pilot program and other watershed analyses.

The results of watershed analysis will influence final decisions both on timing of land-disturbing activities such as timber sales and on application of design features and mitigating measures, including best management practices (BMPs) for water quality protection. Monitoring and evaluating the effectiveness of BMPs is required by Oregon's Nonpoint Source Management Plan to ensure that water quality standards are achieved and that beneficial uses are maintained. When monitoring identifies previously unanticipated impacts, the information gained from that monitoring will be used in subsequent development of mitigating measures, including BMPs, and considered in future watershed analyses.

Factored into these decisions on land-disturbing activities, where appropriate, would be an assessment of compliance with the anti-degradation policy of Oregon's Water Quality Standards (OAR 340-41-026(1) (a). These standards apply to existing high quality waters which exceed those levels necessary to support recreation and the propagation of fish, shellfish and wildlife.

Proposed timber sales and other land-disturbing activities will incorporate the interactive (adaptive management) process for developing, implementing and evaluating nonpoint source pollution control (BMPs) to determine if water quality goals have been met. Modification of non-point-source controls, including BMPs, will be adjusted based upon sound scientific evidence. Where necessary, appropriate actions to mitigate adverse effects on water quality will be taken to protect designated beneficial uses.

Requirement for Further Environmental Analysis

Site-specific planning by Interdisciplinary Teams (IDTs) will precede most on-the-ground management activities. IDTs are comprised of relevant resource management disciplines. The IDT process includes, as appropriate, field examination of resources, identification of alternative management actions, and analysis. Adjacent land uses would be considered during site-specific land management planning.

Site-specific environmental analysis and documentation (including Environmental Assessments (EAs), categorical exclusions or administrative determinations where appropriate, and RMP conformance determination) will be accomplished for each action or type of treatment under consideration. Where the action is to be accomplished by a contractor or timber sale purchaser, the EA or other environmental analysis is a primary means for determining appropriate contract stipulations. Where the action is to be accomplished by BLM personnel, the environmental analysis is a primary means for determining how it will be conducted. When determining whether activities retard or prevent attainment of Aquatic Conservation Strategy objectives, the scale of analysis typically will be BLM analytical watersheds or similar units.

Watershed analysis or province analysis will often precede environmental analysis of specific proposals, and the findings of such preceding analyses will be addressed in documentation of the environmental analyses. Similarly, late-successional reserve assessments will precede activities in those reserves and their findings will be addressed in environmental analysis of those activities. Ultimately, watershed analysis will serve as the basis for developing project-specific proposals and determining monitoring and restoration needs for a watershed. Project-specific NEPA planning will use information developed from watershed analysis. By improving understanding of the ecological structures, functions, processes and interactions occurring within a watershed, watershed analysis will enhance the ability to predict direct, indirect and cumulative impacts of specific proposals in that watershed.

Analyses of proposals for the use of prescribed fire will adhere to the requirements of the Clean Air Act and the State Implementation Plan (including the Visibility Protection Plan and Smoke Management Plan).

Interdisciplinary impact analysis will be tiered within the framework of this and other applicable Environmental Impact Statements (EISs). Tiering is used to prepare more specific documents without duplicating relevant parts of previously-prepared general documents. The more specific EA or other environmental analysis cannot lead directly to a change in the decisions based on the more general EIS to which it is tiered. It could, however, result in some interim management direction pending plan revision, or a proposal to amend the plan. If an EA indicates potential for significant impacts that are seriously different from those described in an existing EIS, a new EIS (or supplement to this or another EIS) may be required.

Specific proposals for treatment to manage competing vegetation would be addressed in site-specific EAs tiered to BLM's EIS, *Western Oregon Program-Management of Competing Vegetation,* 1989. Specific proposals for control of noxious weeds would be addressed in site-specific EAs tiered to

BLM's EIS, *Northwest Area Noxious Weed Control Program*, 1986 as supplemented in 1987.

Availability of EAs for public review will be announced in a minimum of one, and generally all, of the following ways:

- News release distributed to the newsroom of area newspapers, TV, and radio stations.
- Notices posted in the public area at the District Office.
- Mailings to known interested/affected people, groups, tribal units, governmental agencies and businesses. These mailings may include, but are not limited to, District Program Periodic District Planning and Project Update progress reports.
- Legal notices in one or more newspapers circulated in the project area.

Management Assessments and Plans

A management assessment will be prepared for each large late-successional reserve (or group of smaller late-successional reserves) before habitat manipulation activities are designed and implemented. These assessments may be developed as part of province-level planning or as stand-alone assessments. If developed to stand alone, the assessments will be closely coordinated with subsequent watershed analysis and province-level planning. SEIS ROD standards and guidelines should be refined at the province level prior to development of late-successional reserve assessments. Late-successional reserve assessments will generally include:

- a history and inventory of overall vegetative conditions within the reserve,
- a list of identified late-successional associated species known to exist within the late-successional reserve and information on their locations,
- a history and description of current land uses within the reserve,
- a fire management plan,
- criteria for developing appropriate treatments,
- identification of specific areas that could be treated under those criteria,
- a proposed implementation schedule tiered to higher order (i.e., larger scale) plans, and
- proposed monitoring and evaluation components to help evaluate if future activities are carried out as intended and achieve desired results.

Silvicultural treatments for the establishment and maintenance of desired conifer and non-conifer species on units harvested prior to LSR designation may preceed completed management assessments (see C-12 of ROD). Only in unusual circumstances will other silvicultural treatments, including prescribed fire, precede preparation of this management assessment. Late-successional reserve assessments are subject to review by the Regional Ecosystem Office. Until late-successional reserve assessments are completed, fire suppression activities should be guided by land allocation objectives in coordination with local resource management specialists.

Projects and activities within late-successional reserves (including restoration, recreation, projects for public safety, thinning and salvage) may proceed in fiscal years 1995-96 using initial late-successional reserve assessments done at a level of detail sufficient to assess whether the activities are consistent with the objectives of the late-successional reserves.

A management plan will be prepared for the Applegate adaptive management area. An individual public-interagency approach to planning will be developed for the Adaptive Management Area. The plan should address or provide:

- A shared vision of the Adaptive Management Area (e.g., the king of knowledge the participants hope to gain). Identification of the desired future conditions may be developed in collaboration with communities, depending on the area.
- Learning that includes social and political knowledge, not just biological and physical information.
- A strategy to guide implementation, restoration, monitoring and experimental activities.
- A short-term (3 to 5 year) timber sale plan and long-term yield projections.
- Education of participants.
- A list of communities' strategies, and resources and partners being used.
- An inventory of community strategies, and resources and partners being used.
- Coordination with overall activities within the province.
- A funding strategy.
- Integration of the community strategies and technical objectives.

The Draft RMP/EIS identified the need to prepare a number of resource-specific management plans. Depending upon various manual requirements or the purpose of the proposed plans, the need to prepare these plans may have been eliminated due to watershed analysis.

Management of Newly Acquired Lands

Lands may come under BLM administration after completion of the RMP/ROD through exchange, donation, purchase, revocation of withdrawals of other Federal agencies, or relinquishment of Recreation and Public Purpose Act leases. Newly acquired or administered lands or interests in lands will be managed for their highest potential or for the purposes for which they are acquired. For example, lands acquired within "special management areas" with congressional or RMP allocation/direction will be managed in conformance with guidelines for those areas. If lands with unique or fragile resource values are acquired, it may be appropriate to protect those values until the next plan revision.

Lands acquired with no identified special values or management goals will be managed in the same manner as surrounding or comparable BLM-administered land. This implies timber harvest opportunities, intensive timber management practices, management of the mineral estate, standard operating procedures and precommitted mitigation measures.

Costs of Management

The costs of implementing the alternatives would vary, primarily according to the complexity of management proposed the amount of timber that would be offered for sale, and the intensity of management of other resources.

Those alternatives that propose mostly traditional timber management approaches (NA, A, B, D, and E), even though they allocate widely variable acreage for that purpose, would entail timber management costs essentially proportional to the proposed timber sale volume. These would be consistent with past management costs for this purpose. The alternatives that exclude the most lands from timber harvest would tend to increase costs per unit of timber sold, as necessary road investments and maintenance costs would be prorated against less volume. Countervailing savings may occur, however, as the more restrictive alternatives tend to leave those lands requiring the least costly mitigation available for harvest.

In contrast, the costs of non-traditional forest management as proposed in the PRMP and Alternative C could be much higher per unit of timber sold than for the other alternatives. The PRMP, with its requirements for watershed analysis, late-successional reserve assessments, Adaptive Management Area plans and watershed restoration, entails costs not associated with the other alternatives. Many of these additional costs of the PRMP and Alternative C are associated with the ecosystem management approach which focuses on functions of ecosystems. Many of these functions and related forest conditions are not recognized in quantifiable market values and many expected outcomes will not be realized until many years after investments are made.

Alternatives C, D, and E, and the PRMP would have increased costs as a result of implementing a comprehensive non-traditional prescribed fire program outside of the timber sale program. Use of prescribed underburning in Alternatives C, D, and E, and the PRMP to meet wildlife, hazard reduction, and old growth emphasis area objectives, as an example, would require sustainable long-term funding.

The annual cost of implementing the NA Alternative would be similar to the Medford District's Fiscal Year 1993 budget, with slight adjustment for inflation, or approximately $20,900,000. Cost estimates for Alternatives A, B, C, D, and E have not been developed. The initial annual cost of implementing the PRMP is reflected in the Presidents' Fiscal Year 1995 budget, approximately $24,100,000. for the Medford District. However, there is not yet a clear understanding of what the management needs and costs of the ecosystem management approach will be, so future year budget estimates may differ as experience is gained in implementing the PRMP.

The Budget Link

Timber sale levels and associated programs will be reduced if annual funding is not sufficient to support the relevant actions assumed in the plan, including mitigation and monitoring. The extent of the reduction will be based on the principle of program balance as envisioned in the plan. For example, if funding in a given year is sufficient only to support half of planned annual investments in pre-commercial thinning on lands allocated to timber production, the otherwise anticipated timber sale volume for that year would be reduced by half of the portion of the declared probable sale quantity (PSQ) attributable to pre-commercial thinning. If, in subsequent years, budget levels permit BLM to eliminate the backlog of unfunded investments that have accumulated, timber sale levels will be adjusted upward to the extent that the work can be accomplished. If subsequent budget levels create a cumulative shortfall over a few years, the PSQ will be adjusted downward.

This principle will apply similarly to management of roads and other facilities. If maintenance of such facilities is not adequately funded, some of them may be closed to scale back management commitments to the level that is budgeted.

Monitoring

The BLM planning regulations (43 CFR 1610.4-9) call for the monitoring and evaluation of resource management plans at appropriate intervals.

Monitoring is an essential component of natural resource management because it provides information on the relative success of management strategies. The implementation of the RMP will be monitored to ensure that management actions, follow prescribed management direction (implementation monitoring), meet desired objectives (effectiveness monitoring), and are based on accurate assumptions (validation monitoring) (see Appendix R). Some effectiveness and most validation monitoring will be accomplished by formal research.

Monitoring will be an integral component of many new management approaches such as adaptive management and ecosystem management.

Adaptive management is based on monitoring that is sufficiently sensitive to detect relevant ecological changes. In addition, the success of adaptive management depends on the accuracy and credibility of information obtained through inventories and monitoring. Close coordination and interaction between monitoring and research are essential for the adaptive management process to succeed. Data obtained through systematic and statistically valid monitoring can be used by scientists to develop research hypotheses related to priority issues. Conversely, the results obtained through research can be used to further refine the protocols and strategies used to monitor and evaluate the effectiveness of RMP implementation.

Monitoring results will provide managers with the information to determine whether an objective has been met, and whether to continue or modify the management direction. Findings obtained through monitoring, together with research and other new information, will provide a basis for adaptive management changes to the plan. The processes of monitoring and adaptive management share the goal of improving effectiveness and permitting dynamic response to increased knowledge and a changing landscape. The monitoring program itself will not remain static. The monitoring plan will be periodically evaluated to ascertain that the monitoring questions and standards are still relevant, and will be adjusted as appropriate. Some monitoring items may be discontinued and others may be added as knowledge and issues change with implementation. Priorities will be given for monitoring mandated by legislation.

Watershed analysis is one of the principal analyses that will be used to meet the ecosystem management objectives. Information from watershed analysis will also be used in developing monitoring strategies and objectives. Specific to monitoring, the results and findings from watershed analysis are used to reveal the most useful indicators for monitoring environmental change, detect magnitude and duration of changes in conditions, formulate and test hypotheses about the causes of the changes, understand these causes and predict impacts, and manage the ecosystem for desired outcomes. Watershed analysis will provide information about patterns and processes within a watershed and provide information for monitoring at that scale.

The monitoring process will collect information in the most cost effective manner possible, and may involve sampling or remote sensing. Monitoring could be so costly as to be prohibitive if it is not carefully and reasonably designed. Therefore, it will not be necessary or desirable to monitor every management action or direction. Unnecessary detail and unacceptable costs will be avoided by focusing on key monitoring questions and proper sampling methods. The level and intensity of monitoring will vary, depending on the sensitivity of the resource or area and the scope of the proposed management activity.

RMP monitoring will be conducted at multiple levels and scales. Monitoring will be conducted in a manner that allows localized information to be compiled and considered in a broader regional context, and thereby address both local and regional issues. At the project level, monitoring will examine how well specific management direction has been applied on the ground and how effectively it produces expected results. Monitoring at broader levels will measure how successfully projects and other activities have achieved the objectives for those management areas.

Monitoring will be coordinated with other appropriate agencies and organizations in order to enhance the efficiency and usefulness of the results across a variety of administrative units and provinces. The approach will build on past and present monitoring work. In addition, specific monitoring protocols, criteria, goals, and reporting formats will be developed, subject to review and guidance of the Regional Ecosystem Office. This guidance will be used to augment and revise the monitoring plan and facilitate the process of aggregating and analyzing information on provincial or regional levels.

Monitoring results will be reported in an "Annual Program Summary", which will be published starting the second year following initial implementation of this RMP. The Annual Program Summary will track and assess the progress of plan implementation, state the findings made through monitoring, specifically address the Implementation Monitoring Questions posed in each section of this Monitoring Plan and serve as a report to the public.

Each resource area will be responsible for the collection, compilation, and analysis of much of the data gained through monitoring activities. Resource areas will report their findings and recommendations to the district for consolidation and publication in the Annual Program Summary.

The monitoring plan for the RMP is tiered to the Monitoring and Evaluation Plan for the SEIS Record of Decision. That Monitoring and Evaluation Plan is not yet fully refined. Therefore, this Monitoring Plan is not complete. BLM has been, and will continue to be, a full participant in the development of the SEIS Monitoring and Evaluation Plan. Ongoing BLM effectiveness and validation monitoring will continue where it is relevant to Resource Management Plan direction (e.g., stocking surveys, threatened and endangered species studies and water quality measurements).

The SEIS and RMP monitoring plans will not identify all the monitoring the Medford District will do. Activity and project plans may identify monitoring needs of their own.

Research

A research plan will be developed by the Research and Monitoring Committee identified in the SEIS ROD.

Ongoing research in riparian reserves will be analyzed to ensure that significant risk to the watershed does not exist. If significant risk is present and cannot be mitigated, study sites will be relocated. Some activities not otherwise consistent with the objectives may be appropriate, particularly if the activities will test critical assumptions of the President's Forest Plan; will produce results important for establishing or accelerating vegetation and structural characteristics for maintaining or restoring aquatic and riparian ecosystems; or the activities represent continuation of long-term research. These activities will be considered only if there are no equivalent opportunities outside of riparian reserves and key watersheds.

Table 2-1. Riparian Management Areas

	BLM Stream Miles	Average RMA Width[1] (Each side of the stream in feet)					
		A[2]	B[2&3]	C[2&3]	D[2&3]	E[2&3]	PRMP[4]
Order							
1	4,178					50	
2	2,209					60	
3	1,004	75	75	105	140	200	
4	400	75	100	150	200	200	
5	167	75	140	210	280	280	
6+	130	75	160	240	320	320	
Lakes, ponds, and other waters		75	100	150	200	400	

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[1] Actual RMA widths would be determined by on-the-ground riparian vegetation, soil, terrain, and stream characteristics.

[2] Under Alternatives A, B, C, D, and E, 1st and 2nd order streams that are perennial or are intermittent with fish would have an RMA width equal to a 3rd order stream.

[3] Under Alternatives B, C, D, and E, the RMA width on perennial streams, or those with fish (generally 3rd order and larger streams), or adjacent to lakes, ponds, and other waters would extend a minimum of 50-feet horizontal distance or the total width of the riparian zone, whichever is greater, and an average distance that is wider as shown above.

[4] Riparian Reserves for the PRMP are described on page C-30-31 of the ROD in the SEIS and in the Riparian Reserve section of the PRMP in this document.

Table 2-2. Features of Silvicultural Systems - Common Alternatives

	Silvicultural System			
			Structural Retention	
Feature	Even-Aged	Shelterwood Retention (Frost, Soils, Visuals)	High Retention	Low Retention
Target stand	Even-aged (All ages)	(0-20 years) Two-storied (20-Rotation) Even-aged	Ecological old growth	Minimum ecological old growth
Target landscape	N/A	N/A	High connectivity	General connectivity
Harvest constraints	Reforestation	Frost, soils, visuals	Reforestation, high levels of structural retention	Reforestation, structural retention
Size of regeneration patch cuts	N/A	N/A	< 5 acres	N/A
Trees or basal area left/arrangement	None	12-25 trees/acre,BA removed 15-30 years after regeneration harvest	(140-160 ft^2/acre) in patchy harvest grouped	12-15 trees/acre, scattered or
Average dbh retention/range	N/A	20"+ (High-site) 15"+ (Low-site)	Variable	20"+ (High-site) 15"+ (Low-site)
Snag levels	Retain all practical	Retain all practical	Retain all practical Meet PNW-447	Retain all practical Meet PNW-447
Dead and down material	Retain all practical	Retain all practical	Retain all practical Meet PNW-447	Retain all practical Meet PNW-447
Minimum harvest age (years)	Unconstrained	80 (High-sites) 100 (Low-sites)	150	150
Rotation age (years)	CMAI	80 (High-sites) 100 (Low-sites)	150	150

Table 2-3. Potential Fish Habitat Improvement Projects[1]

Resource Area	Priority[2]
Ashland	
Hyatt Lake	3
Jenny Creek	1
Keene Creek	1
Little Applegate River	1
Ninemile Creek	1
Shoat Spring Creek	2
South Fork Little Butte Creek	2
Spring Creek	2
Star Gulch	1
Thompson Creek	1
Yale Creek	3
Butte Falls	
East Evans Creek	1
Elkhorn Creek	3
Grave Creek	1
Lost Creek Reservoir	3
North Fork Big Butte Creek	1
Pleasant Creek	2
Rock Creek	3
Sugarpine Creek	3
Timber Creek	3
West Evans Creek	1
West Fork Elk Creek	3
Glendale	
Bear Creek	3
Bull Run Creek	1
Cow Creek	2
East Fork Elk Valley Creek	3
Galesville Reservoir	3
Quines Creek	1
Riffle Creek	2
Skull Creek	1
Stanley Creek	3
Starvout Creek	3
Walker Creek	1
West Fork Cow Creek	2
Whitehorse Creek	1
Wolf Creek	3

Table 2-3. Potential Fish Habitat Improvement Projects[1] (continued)

Resource Area	Priority[2]
Grants Pass	
Althouse Creek	1
Crooks Creek	1
East Fork and West Forks, Illinois River	3
Galice Creek	2
Grave Creek	1
Hog Creek	3
North Fork Deer Creek	1
Pickett Creek	2
Sucker Creek	1
Waters Creek	1
West Williams Creek	3

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[1] Project work in all cases would involve placing logs, boulders, and possibly other natural and man-made materials in the channel or lakebed. Work on Jenny Creek and Pleasant Creek would also involve riparian rehabilitation using appropriate silvicultural and/or livestock management options. No priority projects to provide fish passage over or around barriers have been identified at this time.

[2] Priority:
1: High potential for increasing fish production capability in a cost-effective manner.
2: Low to moderate potential for increasing fish production capability in a cost-effective manner due to accessibility, stream size, gradient, or flow characteristics.
3: Potential for project work is uncertain until additional inventory is completed.

Table 2-4. Recreation Opportunities

Site/Trail	Acres/Miles	NA	A	B	C	D	E	PRMP
				Existing Recreation Sites				
Ashland Resource Area	Acres							
Beene Cabin	10	X	X	X	X	X	X	X
Hyatt Lake Complex	745	X	X	X	X	X	X	X
Kenney Meadows	35	X	X	X	X	X	X	X
Little Applegate	20	X	X	X	X	X	X	X
Little Hyatt Lake	2	X	X	X	X	X	X	X
Table Mountain Snow Play Area	10	X	X	X	X	X	X	X
Woodrat Mountain	20	X	X	X	X	X	X	X
Butte Falls Resource Area								
Elderberry Flat	80	X	X	X	X	X	X	X
Gold Nugget	53	X	X	X	X	X	X	X
Glendale Resource Area								
Mt. Bolivar Trailhead	2	X	X	X	X	X	X	X
Tucker Flat	20	X	X	X	X	X	X	X
				Potential Recreation Sites				
Ashland Resource Area	Acres							
Anderson Butte	80					X	X	
Applegate	10					X	X	
Blue Jay Spring	40					X	X	
China Gulch	40					X	X	
Dick Lake	40				X	X	X	X
Fredenburg Spring	40				X	X	X	
Jenny Creek	40					X	X	
Parsnip Lakes	40			X	X	X	X	X
Pilot Rock	20			X	X	X	X	X
Sensenig Falls	40					X	X	X
Soda Mountain	20					X	X	
South Fork Little Butte Creek	40					X	X	
Star Gulch	40					X	X	
The Licks	40				X	X	X	X
Thompson Creek	240					X	X	
Upper Applegate	40				X	X	X	X
Yale Creek	60				X	X	X	
Butte Falls Resource Area								
Box Creek	40				X	X	X	X
Brush Creek	10				X	X	X	X
Clark Creek	160					X	X	
Cobleigh Bridge	40					X	X	X
Elk Creek	80					X	X	
Flounce Rock	20				X	X	X	
Fredenburg	40				X	X	X	X
Gold Nugget South	5					X	X	
Middle Creek	80				X	X	X	
Morine Creek	40				X	X	X	
North Fork Big Butte Creek	20				X	X	X	X

Table 2-4. Recreation Opportunities (continued)

Site/Trail	Acres/Miles	NA	A	B	C	D	E	PRMP
Nugget Falls	5			X	X	X	X	X
Raspberry	20					X	X	
Rocky Hill	10				X	X	X	X
Rocky Point	40				X	X	X	X
Seth Bullis	160				X	X	X	X
Skookum Creek Wayside	5					X	X	X
South Fork Big Butte Creek	20				X	X	X	X
Spot Creek	40				X	X	X	
Sugar Pine	30				X	X	X	
Tin Shed	20					X	X	
Touvelle	20				X	X	X	
Upper Elk Creek	160				X	X	X	
Glendale Resource Area								
Burma Pond	20				X	X	X	X
Cold Springs	10			X	X	X	X	X
Galesville Reservoir	40					X	X	X
Ninemile	5					X	X	X
Panther Creek	5					X	X	X
Riffle Creek	5				X	X	X	X
Skull Creek	5					X	X	X
Grants Pass Resource Area								
Deer Creek	40					X	X	
Eight Dollar Mountain Wayside	20		X	X	X	X	X	X
Hobson Horn Overlook	20			X	X	X		
Illinois River Extension	40				X	X	X	X
Lime Rock Cave	20					X	X	
Manzanita Cave	20				X	X	X	X
Old Channel Mine	20					X	X	
Rockydale	40				X	X	X	
Salmon Creek	40					X	X	
Sexton Mountain Overlook	120			X	X	X	X	
Shady Branch	40					X	X	X
Sourgrass	24					X	X	
Waldo Cemetery	20				X	X	X	X
				Existing Trails				
Ashland Resource Area	Miles							
Armstrong Gulch Trail	1	X	X	X	X	X	X	X
Bear Gulch Trail	1	X	X	X	X	X	X	
Grizzly Peak Trail	5	X	X	X	X	X	X	X
Hidden Creek Trail	1	X	X	X	X	X	X	X
Jacksonville National Historic Landmark Trail	5	X	X	X	X	X	X	X
Listening Tree Trail	1	X	X	X	X	X	X	X
Pacific Crest National Scenic Trail	40	X	X	X	X	X	X	X
Sterling Mine Ditch Trail	10	X	X	X	X	X	X	X
Tunnel Ridge Trail	1	X	X	X	X	X	X	X
Wolf Gap Trail	4	X	X	X	X	X	X	X

Table 2-4. Recreation Opportunities (continued)

Site/Trail	Acres/Miles	NA	A	B	C	D	E	PRMP
Butte Falls Resource Area								
Upper Table Rock Trail	2	X	X	X	X	X	X	X
Lower Table Rock Trail	2	X	X	X	X	X	X	X
Glendale Resource Area								
Kelsey Pack Trail	3	X	X	X	X	X	X	X
Mt. Bolivar Trail	1.5	X	X	X	X	X	X	X
Mule Creek Trail	3	X	X	X	X	X	X	X
Potential Trails								
Ashland Resource Area	Miles							
Hyatt Lake-Howard Prairie Lake Trail	14					X	X	X
Butte Falls Resource Area								
Buck Rock-Berry Rock Loop Trail	10					X	X	X
Green Top Loop Trail	10					X	X	X
Medco Railroad Trail (Eagle Point-Butte Falls)	50					X	X	X
Glendale Resource Area								
Bald Ridge Trail	2.5					X	X	X
Galesville Trail	8					X	X	X
Kelsey Pack Trail Extension	2.5					X	X	X
King Mountain Trail	1					X	X	X
London Peak-Grave Creek Trail	3					X	X	X
Upper Mule Creek Trail	24					X	X	X
Wild Rogue Wilderness Trail	3.5					X	X	X
Grants Pass Resource Area								
Grayback Mountain Trail	6.5					X	X	X
Kerby Peak Trail	8			X	X	X	X	X
Lake Selmac Loop Trail	11					X	X	X
Round Top Mountain Trail	5					X	X	X
Existing Special Recreation Management Areas								
Ashland Resource Area	Acres							
Hyatt Lake-Howard Prairie Lake	17,000	X			X	X	X	X
Pacific Crest National Scenic Trail	12,086	X			X	X	X	X
Grants Pass Resource Area								
Rogue National Wild and Scenic River	14,277	X	X	X	X	X	X	X
Potential Special Recreation Management Areas								
Ashland Resource Area	Acres							
Soda Mountain				X	X	X		

Table 2-4. Recreation Opportunities (continued)

Site/Trail	Acres/Miles	NA	A	B	C	D	E	PRMP
Butte Falls Resource Area								
Elk Creek Lake	4,676						X	
Lost Creek Lake	9,492				X	X	X	X
Glendale Resource Area								
Galesville Lake	3,977				X	X	X	X
				Existing National Byways				
Butte Falls Resource Area	**Miles**							
Rogue-Umpqua Scenic Byway	56	X	X	X	X	X	X	X
Glendale Resource Area								
Grave Creek-Marial Back Country Byway	33	X	X	X	X	X	X	X
Grants Pass Resource Area								
Hellgate-Galice Back Back Country Byway	39	X	X	X	X	X	X	X
				Potential National Byways				
Ashland Resource Area	**Miles**							
Hyatt Lake-Howard Prairie Lake Back Country Byway	39				X	X	X	X
McKee Bridge-Anderson Butte Back Country Byway	35				X	X	X	X
Shale City Back Country Byway	10				X	X	X	X
Butte Falls Resource Area								
Butte Falls to Prospect Back Country Byway	23							X
Butte Falls and Glendale Resource Areas								
Cow Creek-West Fork Evans Creek Road Back Country Byway	56				X	X	X	X
Glendale Resource Area								
Lower Cow Creek Road Back Country Byway	18						X	X
West Fork Cow Creek-Eden Valley Back Country Byway	23				X	X	X	X
Grants Pass Resource Area								
Williams-Selma Oregon Caves Highway	30						X	
Williams-Selma Highway	20							X

SOURCE: WODDB VRM inventory records.

Table 2-5. Existing Land Classifications and Withdrawals

Authority[1]	Acreage	Purpose	Effect[2]	Segregative Recommendation Maintain/Revoke
PLO 5105	2,483.48	Lost Creek Reservoir	B	Revoke 716.88 ac.
PLO 6373	840.59	Elk Creek Reservoir	B	Maintain all
PLO 4132	200.00	Sprague Seed Orchard	B	Maintain all
PLO 5481	160.00	Sprague Seed Orchard	B	Maintain all
PLO 1726	15,481.14	Recreation area	B[3]	Revoke 519.80 ac.
PLO 3165	174.21	Recreation area	B	To be determined
PLO 3869	444.35	Recreation site	B	Revoke 90 ac.
WPD 3[4]	5,631.54	Water power	C	Revoke all
WPD 10	12,228.88	Water power	C	Under review
WPD 13	127.27	Water power	C	Revoke all
WPD 18	872.35	Water power	C	Under review
PSR 161	157.49	Power site	C	Under review
PSR 167	495.38	Power site	C	Under review
PSR 258	1,573.16	Power site	C	Revoke 400 ac.
PSR 528	2.17	Power site	C	Under review
PSR 579	313.95	Power site	C	Revoke all
PSR 582	3,632.57	Power site	C	Revoke all
PSR 583	1,799.03	Power site	C	Revoke all
PSR 584	160.00	Power site	C	Revoke all
PSR 619	3,360.34	Power site	C	Under review
PSR 621	5,379.40	Power site	C	Under review
PSR 625	80.00	Power site	C	Revoke all
PSR 635	40.00	Power site	C	Under review
PSR 653	127.00	Power site	C	Revoke all
PSR 686	158.72	Power site	C	Revoke all
PSC 2	6.42	Power site	C	Under review
PSC 143	22,948.95	Power site	C	Under review
PSC 158	71.80	Power site	C	Under review
PSC 196	5.94	Power site	C	Revoke all
PSC 218	1,482.21	Power site	C	Revoke all
PSC 330	1,151.73	Power site	C	Under review
PSC 340	5,207.45	Power site	C	Under review
PLO 3530	210.36	Brewer Spruce RNA	B	Maintain all
Bureau Order of 1/24/1956	875.93	Rogue River basin project	B	Under review
PLO 4289	1,132.39	Rogue River basin project	C	Maintain all
PLO 4037	162.50	Rogue River basin project	B	Maintain all
Secretarial Order of 1/28/1905[5]	22,138.52	Klamath project	B	Maintain 48.67 ac.[5] Revoke 1799.29
Secretarial Order of 2/20/1943	84.64	Medford/SV project	B	Revoke all
Bureau Order of 8/18/1950	80.00	Air navigation site	B	Maintain all

Table 2-5. Existing Land Classifications and Withdrawals (continued)

Authority[1]	Acreage	Purpose	Effect[2]	Segregative Recommendation Maintain/Revoke
PLO 1189	395.50	Recreation site	B	Revoke all
R&PP OR 139	3.90	Sanitary lagoon	B	Maintain all
R&PP OR 651	200.00	Sanitary landfill	B	Maintain all
R&PP ORE 13905	4.20	River access	B	Maintain all
R&PP ORE 010635	80.00	River park	B	Maintain all
R&PP ORE 012309	82.69	Josephine Co. Park	B	Maintain all
R&PP ORE 013232	400.00	Cathedral Hills Park	B	Maintain all
R&PP ORE 013626	6.63	Pinehurst Elem. School	B	Maintain all
R&PP ORE 015451	12.12	Jackson Co. Park	B	Maintain all
R&PP ORE 018320	41.48	Recreation area	B	Maintain all
R&PP ORE 010368	48.56	Josephine Co. Park	B	Maintain all
R&PP ORE 012765	46.76	R&PP classification	B	Revoke
R&PP ORE 016993	35.00	Recreation area	B	Maintain all

[1] PLO: Public land order
PSR: Power site reserve
PSC: Power site classification
R&PP: Recreation and public purpose
WPD: Water power designation

[2] A: Withdrawn from operation of the general land laws, the mining law, and the Mineral Leasing Act.
B: Withdrawn from operations of the General Land and Mining Laws.
C: Withdrawn from operation of the General Land Law.

[3] 2,322.75 acres opened to mineral entry.

[4] Acreage for WPD, PSR, PSC, and Klamath project may include lands managed by other BLM districts.

[5] Recommendation on 20,290.56 acres are still under review.

Table 2-6. Oil and Gas Lease Restrictions

Category	NA	A	B	C	D	E	PRMP
Closed: Nondiscretionary[1]	22,000	22,000	22,000	22,000	22,000	22,000	22,000
Closed: Discretionary[2]	0	0	0	0	0	0	0
Open: No surface occupancy[3]	14,000	37,000	52,000	130,800	126,700	164,700	73,300
Open: With special stipulations[4]	107,600	67,400	115,000	201,200	411,100	431,000	232,500
Open: Standard stipulations	723,900	741,100	678,500	513,500	307,700	249,800	539,700

[1] Congressional and other agency withdrawals including corridors of designated wild rivers and wilderness study areas.
[2] Corridors of rivers for designation as wild.
[3] Proposed or existing BLM withdrawals, administrative sites including recreation sites, powersite reserves, ACECs, ONAs, R&PP Act leases, threatened and endangered plant habitat, bald eagle habitat, managed spotted owl habitat, cultural resource sites, corridors of rivers designated as or suitable for designation as scenic or recreational rivers, RIAs, off-road vehicle closures, and VRM Class I (not currently closed).
[4] Seasonal wildlife restriction, VRM Class II or III management, RMAs (NA-E), community watersheds, RIAs (PRMP), and federal mineral estate only. (Also see Appendix M.)

Table 2-8. Locatable Mineral Restrictions

	NA	A	B	C	D	E	PRMP
Closed: Nondiscretionary[1]	16,800	16,800	16,800	16,800	16,800	16,800	16,800
Closed: Discretionary[2]	4,700	4,800	6,500	13,300	15,400	47,800	20,800
Open: Additional stipulations[3]	155,800	108,900	160,700	320,500	527,500	576,700	293,400
Open: Standard regulations	690,200	737,000	683,500	516,900	307,800	226,200	536,500

[1] Congressional and other agency withdrawals including corridors of designated wild rivers and R&PP Act leases.
[2] Proposed and existing BLM withdrawals.
[3] Powersite reserves, off-highway vehicle closures, critical habitat of threatened and endangered cultural resource sites. Corridors of rivers suitable for designation as wild, scenic, or recreational, or designated as scenic or recreational; seasonal wildlife restriction; VRM Class II or III management; ACECs; ONAs; RIAs (PRMP); minimum RMAs (NA-E); and federal mineral estate only. (Also see Appendix N.)\

Table 2-7. Geothermal Lease Restrictions

Category	NA	A	B	C	D	E	PRMP
Closed: Nondiscretionary [1]	22,000	22,000	22,000	22,000	22,000	22,000	22,000
Closed: Discretionary [2]	0	0	0	0	0	0	0
Open: No surface occupancy [3]	14,000	37,000	52,000	130,800	126,700	164,700	73,300
Open: With special stipulations [4]	107,600	67,400	115,000	201,200	411,100	431,000	232,500
Open: Standard stipulations	724,900	741,100	678,600	513,500	307,700	249,800	539,700

[1] Congressional and other agency withdrawals including corridors of designated wild rivers and wilderness study areas.
[2] Corridors of rivers for designation as wild.
[3] Proposed or existing BLM withdrawals, administrative sites including recreation sites, powersite reserves, ACECs, ONAs, R&PP leases, threatened and endangered plant habitat, bald eagle habitat, managed spotted owl habitat, cultural resource sites, corridors of rivers designated as or suitable for designation as scenic or recreational rivers, RIAs, off-road vehicle closures, and VRM Class I (not currently closed).
[4] Seasonal wildlife restriction, VRM Class II or III management, RMAs (NA-E), community watersheds, RIAs (PRMP), and federal mineral estate only. (Also see Appendix M.)

Table 2-9. Fire Management Categories Applicable to Alternatives NA-E[1]

Resource Value	Wildfire Suppression Level		Prescribed Fire Use		Management Constraints and Objectives
	Intensive	Conditional	Fire Use Area	Fire Fuels Management Area	
Timber Management Land available for timber management	X	X	X	X	- Use natural barrier and breaks and limit the use of dozers within plantation and young pole stands. -Attempt to maintain designated green tree replacement trees during both the timber management suppression action as well as any use of prescribed fire. -Limit the occurrence of continuous high hazard fuels profiles at the sub-watershed and watershed level to reduce large intense wildfires. -Limit prescribed fire use period to spring-like conditions to maintain site productivity and coarse woody debris. -Apply intensive suppression to protect plantations; all other suppression is conditional.
Woodlands		X	X	X	-Identify fire use areas to maintain preferred conifer species by reducing competition from shade tolerant trees and shrubs. -Identify fuels management areas for reducing natural fuel hazards to protect conifer species.
Progeny test sites	X			X	-Use all resources during the suppression action to minimize acreage burned under intensive suppression strategy. -Avoid direct application of fire retardant into progeny measurement trees. -Identify fuels management areas adjacent to sites to reduce natural fuel hazards and protect the site from wildfire.
Forestry intensive Research plots	X			X	-Use all resources during the suppression action to minimize acreage burned under intensive suppression strategy. - Use natural barrier and breaks and limit the use of dozers within established research plots whenever possible. -Identify fuels management areas adjacent to sites to reduce natural fuel hazards and protect the site from wildfire.

Table 2-9. Fire Management Categories Applicable to Alternatives NA-E[1] (continued)

	Wildfire Suppression Level		Prescribed Fire Use		
Resource Value	**Intensive**	**Conditional**	**Fire Use Area**	**Fire Fuels Management Area**	**Management Constraints and Objectives**
Old Growth Management					
Areas allocated to older forest (i.e., OGEAs, Alt. B old growth blocks, old growth adjacent to recreation sites in Alt. D, R&R blocks in Alt. C, and stands over 150 years in Alt. E)		X	X	X	-Identify fire use areas and fire fuels management areas within and adjacent to the OGEA with the objective of simulating the effects of natural fires to meet basic forest health requirements by improving old growth structure, reducing natural fuel hazards, and by reducing the number of shade tolerant trees and shrubs thereby increasing the amount of available soil moisture which reduces the stands susceptibility to insect, disease, and wildfire mortality. -Limit the loss of critical habitat components (down logs and snags) during initial attack, mop-up, and prescribed burning.
Connectivity area (PA) and corridors (Alt. C)		X	X	X	-Identify fire use areas and fire fuels management areas within and adjacent to the restoration and retention blocks that make up the connectivity corridor to simulate effects of natural fires to meet basic forest health requirements by improving old growth structure, reducing fuel hazards, and by reducing shade tolerant trees and shrubs that reduce available soil moisture and increase stands susceptibility to insect, disease, and wildfire mortality. -Limit the loss of critical habitat components (down logs and snags) during initial attack, mop-up, and prescribed burning. -Apply intensive suppression to retention and restoration blocks designated as critical to meeting connectivity area objectives; all other suppression actions would be conditional.
Wildlife Management					

Table 2-9. Fire Management Categories Applicable to Alternatives NA-E[1] (continued)

	Wildfire Suppression Level		Prescribed Fire Use		
Resource Value	Intensive	Conditional	Fire Use Area	Fire Fuels Management Area	Management Constraints and Objectives
Habitat conservation areas (Alt. D)		X	X	X	-Identify fire use areas and fire fuels management areas to simulate effects of natural fires to meet basic forest health requirements by improving old growth structure, reducing fuel hazards, and by reducing shade tolerant trees and shrubs that reduce available soil moisture and increase stands susceptibility to insect, disease, and wildfire mortality. -Limit the loss of critical habitat components (down logs and snags) during initial attack, mop-up, and prescribed burning.
Northern spotted owl nest tree	X		X	X	- Do not fall trees or burn out around established nest sites.
White oak woodland		X	X	X	-Utilize fire use area to reintroduce fire into ecosystem to the benefit of wildlife. -Use natural barrier and breaks when ever possible during suppression actions.
Eagle core area (Bald and Golden)	X		X	X	-Exclude felling of established nest tree and burning out around the area during suppression actions. -Limit aerial operations during nesting periods.
Peregrine falcon core area	X		X	X	-Exclude felling of established nest tree and burning out around the area during suppression actions. -Limit aerial operations during nesting periods.
Big game areas			X	X	-Use natural barrier and breaks when ever possible during suppression actions.
Watershed and Soils Management					

Table 2-9. Fire Management Categories Applicable to Alternatives NA-E[1] (continued)

	Wildfire Suppression Level		Prescribed Fire Use		
Resource Value	Intensive	Conditional	Fire Use Area	Fire Fuels Management Area	Management Constraints and Objectives
Fragile soils		X			-Limit the use of tractors and other major disturbing activities during wildfire suppression. -Assure erosion control though waterbar construction on firelines and provide protective cover such as straw mulch or revegetation of native species.
High risk watersheds	X	X			-Limit the use of tractors, but minimize acreage burned as the primary objective for protection. -Assure prompt rehab through seeding of native species and waterbarring all slopes greater than 15 percent.
Riparian management area		X		X	-Exclude the use of tractors within the established riparian management area. -Use aerial retardant by making parallel drops to the management area. Avoid dropping retardant into any flowing stream. -Limit the use of water for emergency fire fighting from low or seasonal streams if at all possible.
Other Protection Areas					
Areas of critical environmental concerns	X(1a)	X(1b)	X(1c)	X(1d)	-Limit the use of tractor and aerial retardant (if species composition is changed by its use) within all designated ACECs. -(1a) Apply intensive suppression to ACECs when natural vegetation (if known) is not fire dependent for regeneration (site disturbance return interval is greater than 250 years). -(1b) Apply conditional suppression when natural vegetation is dependent on wildfire for regeneration and maintenance of seral dominant species.

Table 2-9. Fire Management Categories Applicable to Alternatives NA-E[1] (continued)

	Wildfire Suppression Level		Prescribed Fire Use		
Resource Value	**Intensive**	**Conditional**	**Fire Use Area**	**Fire Fuels Management Area**	**Management Constraints and Objectives**
					-(1c) Fire use areas apply when fire has a role in the natural ecology of the ACEC. -(1d) Fire fuels management applies when due to past wildfire suppression actions that the intensity of any ensuing wildfire would destroy the ecosystem covered by the ACEC. This includes the application of prescribed fire both within the area and adjacent to the area to protect it from high intensity wildfire.
Research natural areas	X(2a)	X(2b)	X(2c)	X(2d)	Until specific fuel management plans are developed: -Limit the use of tractor and aerial retardant (if species composition is changed by its use)within all designated RNAs. -(2a) Apply intensive suppression to RNAs when natural vegetation (if known) is not fire dependent for regeneration (site disturbance return interval is greater than 250 years). -(2b) Apply conditional suppression when natural vegetation is dependent on wildfire for regeneration and maintenance of seral dominant species. -(2c) Fire use areas apply when fire has a role in the natural ecology of the RNA. -(2d) Fire fuels management applies when due to past wildfire suppression actions that the intensity of any ensuing wildfire will destroy the ecosystem covered by the RNA. This includes the application of prescribed fire both within the area and adjacent to the area to protect it from high intensity wildfire.
Developed recreation sites	X		X	X	-Limit the use of tractors, and minimize the amount of tree felling and general ground disturbance.
Visual resource management		X	X	X	-As a goal under conditional suppression, attempt to limit

Table 2-9. Fire Management Categories Applicable to Alternatives NA-E[1] (continued)

Resource Value	Wildfire Suppression Level		Prescribed Fire Use		Management Constraints and Objectives
	Intensive	Conditional	Fire Use Area	Fire Fuels Management Area	
					average wildfire size to five acres or less areas during initial attack within VRM Class II areas. -Minimize the number of snags and green trees felled to suppression and mop-up. -The use of fugitive retardant (clear) is recommended within VRM II seen areas. -Limit visible mechanized firelines.
Cultural resource area	X				-Restrict the use of tractors and other ground disturbing activities within known cultural sites.
Wild and scenic rivers		X	X	X	-Limit temporary road construction, use of tractors, and aerial retardant within seen areas along scenic and recreational river segments. -No new road construction and restrict use of tractors and other ground-disturbing activities within the corridor of wild segments.
Special habitats		X		X	-Restrictions on use of equipment, retardant, tree falling, and general disturbance. (wetlands, meadows, cliffs, talus, caves, etc.)
Rural interface areas		X	X	X	-Make appropriate use of aerial retardant in areas of concentrated private structures. Limit the use of tractors in areas of domestic watersheds. -Plan timber sales and other management practices with the objective of reducing high hazard fuel concentrations.

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[1] Fire Management direction for the PRMP is described in the PRMP narrative.

Table 2-10. Existing Older Forest Acres Not Available for Timber Management

Forest Type	NA	A	B	C	D	E	PRMP
Mature	88,316	20,800	36,200	89,748	104,111	202,608	102,292
Old growth	40,403	6,800	16,500	45,603	47,390	101,857	45,700
Total	**128,719**	**27,600**	**52,700**	**135,351**	**151,501**	**304,465**	**148,000**

Table 2-11. Special Status Animal Species Management Options

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
Bald eagle	Buffer around nest sites.	Approximately 30-acre core area.			Withdraw from mineral entry.	Withdraw from mineral entry.	Withdraw from mineral entry.		
	Manage for nest sites.	Retain older forests within 1/2-mile of nests. Develop HMP for sites.							
	Seasonal restrictions.	Avoid disturbance within 1/2-mile Feb 1-Aug 15.							
	Provide for future population expansion.	Retain two 80- acre areas for future nest sites.			Manage 30-acre blocks around water bodies for nest sites.	Manage 30-acre blocks around water bodies for nest sites.	Manage 30-acre blocks around water bodies for nest sites.		Manage 30-acre blocks around water bodies for nest sites.
Peregrine falcon	Core Area - 1/2- mile around nest sites.	No timber harvest, no spraying, no surface occupancy.							
	Buffer around core area, one mile.	Manage for prey diversity.							
	Seasonal restriction.	Avoid disturbance Feb 1 - Aug 15.							

Table 2-11. Special Status Animal Species Management Options (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
	Provide for future population expansion.				Maintain potential nests. No surface occupancy.	Maintain potential nests. No surface occupancy.	Maintain potential nests. No surface occupancy.		Maintain potential nests. No surface occupancy.
	Core area 1/4-mile around nest sites.					Withdraw from mineral entry.	Withdraw from mineral entry.		
Northern spotted owl	Seasonal restriction.	No tree falling within 1/4-mile March 1 to Sep 30.			No disturbances within 1/4-mile of nest sites.	No disturbances within 1/4-mile of nest sites.	No disturbances within 1/4-mile of nest sites.		No disturbances within 1/4-mile of nest sites.
	Large habitat conservation areas (HCA).					No timber harvest or salvage. Minimize road construction.			See LSRs in Table S-1.
	HCA 4s. 80 acres around pair sites.					No timber harvest or salvage. Minimize road construction.			No timber harvest or salvage. Minimize road construction.
	Lands outside HCAs.					Maintain dispersal habitat (50-11-40).			

Table 2-11. Special Status Animal Species Management Options (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
	Retain older forests.						Stands over 150 years old; all owl habitat within 2 miles of pair sites and additional younger stands within one mile.		
Marbled murrelet	Seasonal restriction.	Avoid disturbance around nest sites March 1 to July 15.							
Townsends big-eared bat	Provide 30-acre buffer around active caves.				Protect cave, no road construction, seasonal restriction on recreation, and no surface occupancy.	Protect cave, no road construction, seasonal restriction on recreation, and no surface occupancy.	Protect cave, no road construction, seasonal restriction on recreation, and no surface occupancy.		Protect cave, no road construction, seasonal restriction on recreation, and no surface occupancy.
Northern goshawk	Protect all nest sites.					Nest sites would be protected.	Nest sites would be protected.		Nest sites would be protected.
	Reserve nesting blocks for core areas.						No timber harvest in 40-acre blocks in each section of BLM-administered land.		

Table 2-11. Special Status Animal Species Management Options (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
Siskiyou and Del Norte salamanders	Protect known sites.		Avoid surface-disturbing activities within 100 feet.	Avoid surface-disturbing activities within 100 feet.		Avoid surface-disturbing activities within 100 feet.	Avoid surface-disturbing activities within 100 feet.		Avoid surface-disturbing activities within 100 feet.
Jenny Creek sucker and redband trout			No timber harvest or surface-disturbing activities within steep canyon areas.		No timber harvest or surface-disturbing activities within steep canyon areas.	No timber harvest or surface-disturbing activities within steep canyon areas.	No timber harvest or surface-disturbing activities within steep canyon areas.		No timber harvest or surface-disturbing activities within steep canyon areas.

Table 2-12. Existing and Potential Special Area Management

			Management by Alternative						
Area Name	Acres	Primary Management Objectives	NA	A	B	C[1]	D[2]	E[3]	PRMP
Existing: Areas of Critical Environmental Concerns									
Eight Dollar Mountain	1,247	Special status plants and Darlingtonia wetlands.	Designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated. Available for timber harvest. Restricted to OHV use. Open to mineral entry. Acquisition needed.	Designated. Closed for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to no surface occupance (NSO). Open to mineral entry. Acquisition needed.	Designated, same as C.	Designated, same as C.	Designated, same as C.
King Mountain Rock Garden	67	Special status plants and plant communities.	Designated. Not available for timber harvest. Open or restricted OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Not designated. Available for timber harvest.	Designated, same as NA.	Designated, same as NA. Closed to OHV use.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Table Rocks	1,240	Dwarf meadowfoam, which occurs nowhere else in the world, other special status plant and animal species, unique geology and scenic values, and education opportunities.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Open to mineral entry. Acquisition needed.	Designated, same as A.	Designated, same as A.	Designated, same as NA. Closed to mineral entry.	Designated, same as C.	Designated, same as C.	Designated, same as C.

Table 2-12. Existing and Potential Special Area Management (continued)

			Management by Alternative						
Area Name	Acres	Primary Management Objectives	NA	A	B	C[1]	D[2]	E[3]	PRMP
Existing: Research Natural Areas									
Brewer Spruce	390	Brewer spruce forest and aquatic cell for mid- to high-elevation permanent pond.	Designated. Not available for timber harvest. Closed to OHV use Mineral leasing subject to NSO. Open to mineral entry.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated. Not available for timber harvest. OHV use restricted to designated roads. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as B.	Designated, same as B.	Designated, same as B.	Designated, same as B.
Woodcock Bog	280	Darlingtonia wetland on serpentine and for special status plant species.	Designated. Not available timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated, same as NA.	Designated, same as NA.	Designated, same as NA.	Designated, same as NA.	Designated, same as NA.
Existing: Environmental Education Areas									
Flounce Rock	495	Baker cypress stand, historic, cultural, scenic, educational, and wildlife values.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated as Environmental education area. Management same as C. The 10-acre Baker cypress stand designated as ACEC.

Table 2-12. Existing and Potential Special Area Management (continued)

			Management by Alternative						
Area Name	Acres	Primary Management Objectives	NA	A	B	C[1]	D[2]	E[3]	PRMP
Hidden Creek	20	Environmental education.	Designated. Available for timber harvest. Open to OHV use. Mineral leasing subject to NSO. Open to mineral entry.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Hollenbeck	20	Environmental education.	Designated. Available for timber harvest. Open to OHV use. Mineral leasing subject to NSO. Open to mineral entry.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Listening Tree	15	Environmental education.	Designated. Available for timber harvest. Open to OHV use. Mineral leasing subject to NSO. Open to mineral entry.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Designated. Available for timber harvest. Open to OHV use. Open to entry.	Designated. Not available for timber harvest. OHV use restricted to mineral existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.

Table 2-12. Existing and Potential Special Area Management (continued)

			Management by Alternative						
Area Name	Acres	Primary Management Objectives	NA	A	B	C[1]	D[2]	E[3]	PRMP
New: Areas of Critical Environmental Concern									
Bill Creek	40	Port-Orford cedar natural systems, wildlife, and special status species.	Not designated, Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated, Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Not designated. See App. 2-SA-2.
Bobby Creek	428	Natural systems, botanical, special status species, and wildlife fisheries.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, manage same as E. 428 acres designated as ACEC and 1,702 acres designated as RNA.
Cedars of Beaver Creek	39	Natural systems, botanical, and wildlife.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Not designated. See App. 2-SA-2

Table 2-12. Existing and Potential Special Area Management (continued)

			Management by Alternative						
Area Name	**Acres**	**Primary Management Objectives**	**NA**	**A**	**B**	**C[1]**	**D[2]**	**E[3]**	**PRMP**
Crooks Creek	149	Natural systems, wildlife, and special status species.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Dakubetede	5,420	Natural systems, special status plants and animals, and historic values.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Not designated. See App. 2-SA-2
Enchanted Forest	79	Natural systems, wildlife, and special status plants and animals.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Not designated. See App. 2-SA-2

Table 2-12. Existing and Potential Special Area Management (continued)

Area Name	Acres	Primary Management Objectives	Management by Alternative						
			NA	A	B	C[1]	D[2]	E[3]	PRMP
Baker Cypress acres	10	Baker cypress stand, historic, cultural, scenic, educational, and wildlife values.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated 495- as Flounce Rock Environmental Education area. Management same as C. The 10-acre Baker cypress stand designated as ACEC.
French Flat	656	Special status plants and plant communities.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO. Closed to OHV.	Designated, same as E.
Hole-In-The Rock	63	Scenic and geological values.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.

Table 2-12. Existing and Potential Special Area Management (continued)

Area Name	Acres	Primary Management Objectives	Management by Alternative NA	A	B	C^1	D^2	E^3	PRMP
Hoxie Creek	255	Natural systems, wildlife and botanical values.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as E.
Iron Creek	286	Natural systems, wildlife and botanical values.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as D.	Designated, same as D.
Jenny Creek	966	Natural systems, riparian values, special status fish and other special status plants and animals.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO. Acquisition needed.	Designated, same as C.	Designated, same as C.	Designated, same as C.

Table 2-12. Existing and Potential Special Area Management (continued)

Area Name	Acres	Primary Management Objectives	Management by Alternative NA	A	B	C[1]	D[2]	E[3]	PRMP
Larkspur	2,440	Natural systems, wildlife, and special status species.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Not designated. See App. 2-SA-2.
Little Hyatt	296	Natural systems, wildlife, and special status plants and animals.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as D.	Not designated. See App. 2-SA-2.
Moon Prairie	91	Natural systems.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as E.

Table 2-12. Existing and Potential Special Area Management (continued)

Area Name	Acres	Primary Management Objectives	Management by Alternative						
			NA	A	B	C[1]	D[2]	E[3]	PRMP
Pacific Crest Trail	12,086	National scenic trail.	Not designated. Available for timber harvest. Closed to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. No surface disturbance within 150 feet of trail.	Designated, same as C.	Designated, same as C.	Not designated. See App. 2-SA-2.
Pilot Rock	544	Geological formation, fossil beds, wildflower meadows, and special status plants and animals.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Poverty Flat	29	Natural systems, vernal pool wetlands, and special status plants.	Not designated. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.

Table 2-12. Existing and Potential Special Area Management (continued)

			Management by Alternative						
Area Name	Acres	Primary Management Objectives	NA	A	B	C[1]	D[2]	E[3]	PRMP
Rock Creek	160	Natural systems, wildlife, and special status species.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Not designated. See App. 2-SA-2.
Rogue River	68,644	Scenic values and wildlife migration route.	Not designated. Available for timber harvest. Closed to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use limited to designated roads. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Not designated. See App. 2-SA-2.
Rough & Ready		Natural systems special status plants							Designated. Not available for timber harvest. OHV use limited to designated roads. Mineral leasing subject to NSO.
Siskiyou Mountain Natural Area	20,000	Natural systems, wildlife, and special status plants and animals.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Not designated. See App. 2-SA-2.

Table 2-12. Existing and Potential Special Area Management (continued)

			Management by Alternative						
Area Name	Acres	Primary Management Objectives	NA	A	B	C[1]	D[2]	E[3]	PRMP
Sterling Mine Ditch	141	Historic mining ditch, hiking trail, and special status species.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Tin Cup	84	Natural systems and botanical and wildlife values.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, same as D.	Designated, same as D.
Williams Watershed	13,950	Natural systems, wildlife and botanical and special status species.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Not designated. See App. 2-SA-2.

Table 2-12. Existing and Potential Special Area Management (continued)

Area Name	Acres	Primary Management Objectives	Management by Alternative NA	A	B	C[1]	D[2]	E[3]	PRMP
New: Research Natural Areas									
Bobby Creek	1,702	Natural systems, botanical, special status species, and wildlife fisheries.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. OHV use restricted to existing roads. Mineral leasing subject to NSO.	Designated, manage same as E. 428 acres designated as ACEC and 1,702 acres designated as RNA.
Brewer Spruce Enlargement	1,384	Natural area of Brewer spruce forest for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Grayback Glade	1,069	Terrestrial white-fir Port-orford-cedar and aquatic first order stream for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as C. No surface disturbance within 100 feet of boundary.	Designated, same as D.	Designated, same as D.

Table 2-12. Existing and Potential Special Area Management (continued)

Area Name	Acres	Primary Management Objectives	Management by Alternative						
			NA	A	B	C[1]	D[2]	E[3]	PRMP
Holton Creek	423	Terrestrial Douglas-fir, white fir forest for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as E.
Lost Lake	384	Low elevation natural lake and mixed conifer forest for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as C.	Designated, same as C.	Designated, same as C.
North Fork Silver Creek	499	Douglas-fir/ white fir forest with diverse shrub understory and third order stream; for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as C. No surface disturbance within 100 feet of boundary.	Designated, same as D.	Designated, same as D.

Table 2-12. Existing and Potential Special Area Management (continued)

			Management by Alternative						
Area Name	Acres	Primary Management Objectives	NA	A	B	C[1]	D[2]	E[3]	PRMP
Old Baldy	166	White fir at high elevation with Shasta red fir/ mountain hemlock/ Pacific silver fir/white pine and chaparral communities; for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as C.	Designated, same as C.	Designated, same as C.
Oregon Gulch	1,047	Mixed conifer forest and manzanita-ceanothus/ bunch grass chaparral communities; for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as E.
Pipe Fork	529	Port-orford-cedar/oregon grape and Port-Orford cedar/salal communities; for scientific research and baseline study area.	Not designated. Available for timber harvest. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Not designated, same as NA.	Designated. Not available for timber harvest. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as E.

Table 2-12. Existing and Potential Special Area Management (continued)

Area Name	Acres	Primary Management Objectives	Management by Alternative: NA	A	B	C[1]	D[2]	E[3]	PRMP
Round Top Butte	604	Oak/grass savannah, oak/ponderosa pine woodland, and typical grassland mosaic; for scientific research and baseline study area.	Not designated. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Designated. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as B.	Designated, same as B.	Designated, same as B.	Designated, same as B.
Scotch Creek	1,797	Typical chaparral community in eastern Siskiyous for scientific research and baseline study area.	Not designated. Open to OHV use. Open to mineral entry.	Not designated, same as NA.	Not designated, same as NA.	Designated. Closed to OHV use. Mineral leasing subject to NSO. Closed to mineral entry.	Designated, same as C.	Designated, same as C.	Designated, same as C.

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[1] The following potential special areas were omitted from the Alternative C map: Bill Creek, Brewer Spruce Enlargement, Crooks Creek, Scotch Creek, and Siskiyou Mountains.

[2] The following potential special areas were omitted from the Alternative D map: Bill Creek, Brewer Spruce Enlargement, Crooks Creek, Iron Creek, Little Hyatt, Scotch Creek, Siskiyou Mountain, and Tin Cup.

[3] The following potential special areas were omitted from the Alternative E map: Bill Creek, Bobby Creek, Brewer Spruce Enlargement, Cedars of Beaver Creek, Crooks Creek, Dakubetede, Enchanted Forest, French Flat, Holten Creek, Hoxie Creek, Iron Creek, Larkspur, Little Hyatt, Moon Prairie, Oregon Gulch, Pipe Fork, Scotch Creek, Siskiyou Mountains, Tin Cup, and Williams Watershed.

Table 2-13. Estimated Hardwood Volume Available in the Next Decade (Million cubic feet)

Volume Source	NA	A	B	C	D	E	PRMP
Conifer harvest units	5.883	8.860	7.664	1.534	1.724	0.162	1.865
Stand conversion	00.000	16.912	16.912	00.000	00.000	00.000	00.000
Hardwood management	0.000	0.582	0.000	0.720	0.000	0.000	0.267
Total	**5.883**	**26.350**	**24.570**	**2.250**	**1.724**	**0.162**	**2.132**

Table 2-14. Priority Wildlife Animal Species Habitat Protection

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
Cavity users	Snag and green tree retention on lands not allocated to timber management.	Provide for 100 percent of optimum woodpecker populations.							
	Snag and green tree retention on lands allocated to timber management.	Unmerchantable snags and culls would be retained unless safety hazard.		Provide for 40 percent of optimum woodpecker populations.	Provide for 60 percent of optimum woodpecker populations.	Provide for 60 percent of optimum woodpecker populations.	Provide for 60 percent of optimum woodpecker populations. Also, leave 20 percent of harvest units in 2-acre patches.		Provide for 40 percent of the mean number of snags found in unentered stands.
	Snag and green tree retention within HCAs.					Retain all snags.			
Coarse woody debris (CWD)	CWD retention on lands not allocated to timber management.	CWD would be retained to approximate the mean levels found in unentered stands.							
	CWD retention on lands allocated to timber management.	CWD retention: 520 tons/100 acres.	CWD retention: 520 tons/100 acres.	CWD retention: 520 tons/100 acres.	Retain all CWD.	CWD retention: 520 tons/100 acres.	CWD retention: 520 tons/100 acres.		Retain 20-linear feet per acre logs equal to or greater than 16 inches in diameter and 16 feet long.
	CWD retention within HCAs.					Retain all CWD.			

Table 2-14. Priority Wildlife Animal Species Habitat Protection (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
Special habitats (meadows, caves, wetlands, springs, etc.)	Protection.	Special habitats would be protected or enhanced for wildlife habitat.			100- to 200-foot buffer.	100- to 300-foot buffer.	100- to 300-foot buffer.		100- to 200-foot buffer.
	New road location.	Roads would avoid special habitats and minimize effects to wetlands and riparian areas.							
	Off-highway vehicle closure.	Meadows and wetlands would be closed to off-highway vehicle use.							
Cliffs	Protection.	Peregrine nests and potential peregrine nests would be protected.							
Talus slopes	Protection.	Sites where Del Norte and Siskiyou salamanders are found would be protected.							
Land tenure	Land acquisition.				Within elk management areas, lands would be acquired to facilitate elk habitat management.	Within elk management areas, lands would be acquired to facilitate elk habitat management.	Land would be acquired to facilitate wildlife habitat management.		Land would be acquired to facilitate wildlife habitat management.

Table 2-14. Priority Wildlife Animal Species Habitat Protection (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
Roosevelt elk	Maintain target habitat conditions.	Site specific plans would be developed for all big game management areas.		Lands within elk management areas would meet 20 percent forage, 30 percent cover, and 30 percent hiding cover where consistent with timber management.	At least 20 percent of the lands within elk management areas would be in forage habitat.	Lands within elk management areas would meet 20 percent forage, 30 percent cover, and 30 percent hiding cover where consistent with northern spotted owl management.	Lands within elk management areas in the Dead Indian area of Cascades would maintain at least 10 percent thermal cover.		Within selected elk management areas, forage and cover would be managed to maintain habitat effect indices of at least 0.6.
	Improve forage conditions.		Regeneration units would be seeded where it would not conflict with timber production.	Regeneration units would be seeded where it would not conflict with timber production.	Only native species would be used. Permanent forage areas would be created only on lands not managed for timber.	Only native species would be used for forage seedings.	Forage quality would be optimized in timber harvest units. Permanent forage areas would be created only on lands not managed for timber.		Within elk management areas, forage would be managed by creating small openings, burning, seeding, fertilizing, and other means.
	Motor vehicle and road management.		Block or close roads where it would not conflict with other management.	Within elk management areas, block or close roads where it would not conflict with other management.	Within elk management areas, manage open road density for target of 1.5 miles of road per square mile.	Within elk management areas, manage open road density for target of 1.5 miles of road per square mile.	Throughout the planning area, manage open road density for target of 1.5 miles of road per square mile.		Within selected elk management areas, manage open road density for target of 1.5 miles of road per square mile.

Table 2-14. Priority Wildlife Animal Species Habitat Protection (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
	Land tenure.			Within elk management areas, lands would be acquired to facilitate habitat management.	Within elk management areas, lands would be acquired to facilitate habitat management.	Within elk management areas, lands would be acquired to facilitate habitat management.	Lands would be acquired to facilitate habitat management.		Lands would be acquired to facilitate habitat management.
Deer winter range areas	Thermal cover.						Timber harvest would be prohibited in thermal cover stands. Habitat management plans would be prepared.		At least 20 percent of these areas would be maintained in thermal cover. Habitat management plans would be prepared unless incorporated into watershed analysis.
	Seasonal restrictions.								Activities would be restricted to avoid disturbance Nov. 15 to April 1.
	Motor vehicle and road management.						Motor vehicle use would be limited to arterial roads only, Nov. 15 to April 1.		All roads except major collectors and arterials would be closed Nov. 15 to April 1. New road construction would be minimized.

Table 2-14. Priority Wildlife Animal Species Habitat Protection (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
	Forage enhancement.						Forage quality would be optimized in regenerated harvest units.		
	Permanent forage areas.						Permanent forage areas would be created only on lands not managed for timber.		Permanent forage areas would be created only on lands not managed for timber.
Raptors and great blue herons	Nest site protection.				Habitat would be protected. Disturbance	Habitat would be protected. Disturbance	Habitat would be protected. Disturbance		Habitat would be protected.
Disturbance					would be avoided during nesting season.	would be avoided during nesting season.	would be avoided during nesting season.		would be avoided during nesting season.
Golden eagles	Protection of 30-acre core around nest site.					No timber harvest or habitat removal. No new road construction	No timber harvest or habitat removal. No new road construction		No timber harvest or habitat removal. No new road construction
	Seasonal restriction.					Disturbance would be avoided during nesting season.	Disturbance would be avoided during nesting season.		Disturbance would be avoided during nesting season.

Table 2-14. Priority Wildlife Animal Species Habitat Protection (continued)

Species or Habitat	Action	Common	A	B	C	D	E	No Action	PRMP
Amphibians, pileated woodpeckers and goshawks and goshawks	Land allocation.						A 40-acre block per section of older stands would be reserved for habitat.		
Accipiter hawks	Retention of unthinned stands.						At least 20 percent of all late seral stands would be left unthinned for nesting habitat.		
White oak woodlands	Management goals.				Maintain or enhance values for wildlife, range, plants and biological diversity.	Maintain or enhance values for wildlife, range, plants and biological diversity.	Maintain or enhance values for wildlife, range, plants and biological diversity.		Maintain or enhance values for wildlife, range, plants and biological diversity.

Table 2-15. Potential Off-Highway Vehicle Designations[1] (Acres)

	NA		A		B		C		D		E		PRMP		
Area	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Remarks
Existing sites (see Map 2-6)	1,000		1,000		1,000		1,000		1,000		1,000		1,000		Limited to existing recreation roads.
Potential sites (see Map 2-6)	0		30		250		1,400		1,400		2,500		1,100		Limited to existing recreation roads.
Existing trails (see Map 2-6)	90		90		90		90		90		90		90		Developed trails are usually closed to off-highway vehicle (OHV) use.
Potential trails (miles)	0		5		15		15		20		180		180		Developed trails are usually closed to OHV use.
Wilderness study areas (see Map 2-3)	5,867	429	5,867	429	5,867	429	5,867	429	5,867	429	5,867	429	5,867	429	
Potential wild and scenic rivers (see Map 2-3)									640	28,800	32,000		7,400		Potential recreational rivers. Limited to existing roads.
Special areas (see Map 2-4)															
ACECs	2,600		1,200		2,600		104,500		105,400		130,400		5,836	1,400	Table Rocks, closed.
RNAs		670		0		1,300		6,700		6,700		10,274		10,274	
EEAs	30			0	30		30		30		30		550		
Fragile soil areas (see Map 2-9)									85,320		138,000		138,000		Limited to designated roads and seasonal limitation.

Table 2-15. Potential Off-Highway Vehicle Designations[1] (Acres) (continued)

	NA		A		B		C		D		E		PRMP		
Area	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Limited	Closed	Remarks
Riparian management areas (Riparian Reserves PRMP)	12,990		35,700		43,400		60,600		114,500		158,900		71,700		Limited to existing roads.
Wetlands		>1,000		>1,000		>1,000		>1,000		>1,000		1,000		>1,000	Closed, exact acres unknown.
High risk watersheds													49,636		Limited to designated roads. Seasonal limitation.
Deer and elk management areas (see Map 2-11)							118,100		118,100		235,200		205,100		Seasonal limitations.
LSRs (see Maps 2-2 and 2-8													192,700		Limited to designated roads.
R&R blocks (see Map C, Draft RMP)							152,000								Limited to designated roads.
HCAs									217,000						Seasonal limitations and limited to designated roads.
Alternative B old-growth blocks (see Map B, Draft RMP)					51,000										Limited to existing roads.
Old-growth adjacent to recreation sites									7,490						Limited to existing roads.

Table 2-15. Potential Off-Highway Vehicle Designations[1] (Acres) (continued)

	NA		A		B		C		D		E		PRMP		
Area	**Limited**	**Closed**	**Limited**	**Closed**	**Limited**	**Closed**	**Limited**	**Closed**	**Limited**	**Closed**	**Limited**	**Closed**	**Limited**	**Closed**	**Remarks**
SRMAs (see MAP 2-6)	31,277	1,086	14,277		14,277		50,386	12,086	50,386	12,086	55,062		44,700	12,086	Limited to existing roads except PCT, which is closed.
Table Mountain snow play area		10		10		10		10		10		10		10	Closed.
Pokegama				7,000		7,000		7,000		7,000		7,000		7,000	Closed between area 11/15 to 03/31.
Ferris Gulch			2,200		2,200		2,200		2,200		2,200		2,200		Limited to existing roads and designated trails.
Quartz Creek			7,120		7,120		7,120		7,120		7,120		7,120		Limited to existing roads and designated trails.
Timber Mountain/			16,250		16,250		16,250		16,250		16,250		16,250		Limited to existing roads and designated trails.
Cascade/ Siskiyou ecological emphasis area													16,300		Limited to designated roads.
Illinois Valley botanical emphasis area													10,600		Limited to designated roads.

[1] Includes overlap.

Table 2-16. Management of Identified Rural Interface Areas

	BLM Acre						
Rural Interface Area	**NA**	**A**	**B**	**C**	**D**	**E**	**PRMP**
Bear Creek	-	-	380	3,400	3,400	6,500	3,400
Big Butte Creek	-	-	280	4,000	4,000	6,800	4,000
Camp Creek	-	-	-	42	42	157	42
Cottonwood Creek	-	-	-	1,700	1,700	3,200	1,700
Cow Creek-Galesville	-	-	-	-	-	-	-
Cow Creek-Glendale	-	-	450	900	900	2,900	900
Deer Creek	-	-	1,700	4,200	4,200	8,500	4,200
Elk Creek	-	-	30	1,900	1,900	3,700	1,900
Evans Creek	-	-	1,400	8,300	8,300	14,400	8,300
Grave Creek	-	-	840	6,500	6,500	13,000	6,500
Jenny Creek	-	-	-	5,200	5,200	10,400	5,200
Jumpoff-Joe Creek	-	-	3,500	8,900	8,900	11,900	8,900
Little Applegate	-	-	500	5,500	5,500	10,200	5,500
Little Butte Creek	-	-	330	8,000	8,000	14,600	8,000
Lost Creek	-	-	170	2,600	2,600	4,600	2,600
Lower Applegate	-	-	4,500	8,200	8,200	13,600	8,200
Middle Applegate	-	-	2,000	12,700	12,700	22,500	12,700
North Fork Silver Creek	-	-	-	-	-	-	-
Rogue-Gold Hill	-	-	2,100	15,800	15,800	24,100	15,800
Rogue-Grants Pass	-	-	4,400	8,000	8,000	10,900	8,000
Rogue-Rec. Section	-	-	3,200	5,100	5,100	8,700	5,100
Rogue-Trail Creek	-	-	1,400	9,600	9,600	16,400	9,600
Rogue-Wild Section	-	-	-	-	-	-	-
Upper Applegate	-	-	530	970	970	2,300	970
Upper Illinois	-	-	3,500	11,400	11,400	17,800	11,400
West Fork Cow Creek	-	-	-	-	-	-	-
Williams Creek	-	-	1,000	3,900	3,900	6,800	3,900

Table 2-17. Buffering of Special Habitats[1]

Special Habitat	NA	A	B	C	D	E	PRMP
Wet meadows				100-200NC	100-300NC	100-300NC	100-200NC
Dry meadows				100-200NC	100-300NC	100-300NC	100-200NC
Caves				100-200NC	100-300NC	100-300NC	100-200NC

[1] For protection measures for cliffs and talus slopes, refer to Special Status Species for direction for peregrine falcons and Del Norte salamanders.
PC: Partial cut buffer
NC: No cut buffer

Table 2-18. Acquisition Needs to Improve Watershed Management for Fish Production

Stream	NA	A	B	C	D	E	PRMP
Klamath River Basin							
Jenny Creek				X	X	X	X
Applegate River Sub-Basin							
Little Applegate River				X	X	X	X
Waters Creek				X	X	X	X
Ninemile Creek				X	X	X	X
Star Gulch				X	X	X	X
Cow Creek Sub-Basin							
Starvout Creek				X	X	X	X
Snow Creek				X	X	X	X
Riffle Creek				X	X	X	X
Whitehorse Creek				X	X	X	X
West Fork Cow Creek				X	X	X	X
Cow Creek below Dad's Creek				X	X	X	X
Rattlesnake Creek				X	X	X	X
Rogue River Tributaries							
Grave Creek				X	X	X	X
West Fork Evans Creek				X	X	X	X
East Fork Evans Creek				X	X	X	X
North Fork Big Butte Creek				X	X	X	X
South Fork Big Butte Creek				X	X	X	X
Big Butte Creek above Clark Creek				X	X	X	X
Beaverdam/Vine Maple Creek				X	X	X	X
Elk Creek				X	X	X	X
Pickett Creek				X	X	X	X
Galice Creek				X	X	X	X
South Fork Little Butte Creek above Lost Creek				X	X	X	X
Illinois River Sub-Basin							
North Fork Deer Creek				X	X	X	X
South Fork Deer Creek				X	X	X	X
Crooks Creek				X	X	X	X
Upper Althouse Creek				X	X	X	X
Upper Sucker Creek				X	X	X	X

Table 2-19. Wild, Scenic, and Recreational River Suitability[1]

River Name	Total Segment Length (Miles)	NA	A	B	C	D	E	PRMP
Ashland Resource Area								
Jenny Creek	17.6						S[2]	
Lost Creek (segment 2)	0.9						W[2]	
Ninemile Creek	1.6						R[2]	
Soda Creek	3.8						R	
Star Gulch Creek	8.1						R	
Butte Falls Resource Area								
North Fork Big Butte Creek	13.4						R	
Rock Creek	6.0						R	
Glendale Resource Area								
Alder Creek	1.0						W	
Booze Creek	0.9						W	
Bronco Creek	1.5						W	
Bunker Creek	6.4						W	
Copsey Creek	1.1						W	
Cowley Creek	0.8						W	
Ditch Creek	2.1						W	
East Fork Elk Valley Creek	2.3						R	
Kelsey Creek	4.7						W	
Meadow Creek	3.8						W	
Quail Creek	1.8						W	
Russian Creek	1.9						W	
Slide Creek	1.0						W	
Stanley Creek	1.5						R	
Whiskey Creek to East & West Forks	2.4					W	W	
East Fork Whiskey Creek	3.7						W	
West Fork Whiskey Creek	5.9						W	
Whitehorse Creek	3.5						R	
Grants Pass Resource Area								
Anna Creek	1.7						W	
Ash Creek	2.6						W	
Bailey Creek	2.7						W	
Big Windy Creek	6.8						W	W
East Fork Big Windy Creek	3.6						W	W
Centennial Gulch Creek	1.8						W	
Dulog Creek	1.7						W	W
Grave Creek	10.9						R	
Hewitt Creek	2.2						W	
Howard Creek	7.0						W	W
Jenny Creek	4.4						W	
Little Windy Creek	2.5						W	
Long Gulch Creek	2.0						W	
Missouri Creek	4.4						W	
Montgomery Creek	1.3						W	
North Fork Deer Creek	2.9						W	
North Fork Galice Creek	5.5						R	

Table 2-19. Wild, Scenic, and Recreational River Suitability[1] (continued)

River Name	Total Segment Length (Miles)	NA	A	B	C	D	E	PRMP
North Fork Silver Creek	6.0						R	
Powell Creek	7.7						R	
Quartz Creek	2.4						W	
Rum Creek	3.2						W	
Wildcat Creek	1.7						W	

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[1] Includes only those segments previously found eligible and where BLM administers at least 40 percent of the land (plus Jenny Creek).

[2] S: Scenic
W: Wild
R: Recreational

Table 2-20. Riparian Management Objectives by Stream Type for Alternatives C, D, and E.

Stream Type	Water Quality Objectives	Stream Ecosystem Objectives	Riparian Ecosystem Objectives
Order 1 Intermittent	Minimize water quality degradation (prevent entry of pollutants and minimize sediment loading and movement downstream).	Maintain channel and streambank stability.	
Order 1 Perennial or with fish	Maintain water quality (prevent entry of pollutants, minimize sediment loading and movement downstream, and maintain maximum summer stream temperatures).	Maintain high levels of biological, chemical, and physical functions.	Maintain riparian habitat for high levels of wildlife and native plant diversity.
Order 2 Intermittent	Minimize water quality degradation (prevent entry of pollutants and minimize sediment loading and movement downstream).	Maintain moderate levels of biological, chemical, and physical functions.	Maintain riparian habitat for low to moderate levels of wildlife and native plant diversity.
Order 2 Perennial or with fish	Maintain water quality (prevent entry of pollutants, minimize sediment loading and movement downstream, and maintain maximum summer stream temperatures).	Maintain high levels of biological, chemical, and physical functions.	Maintain riparian habitat for high levels of wildlife and native plant diversity.
Order 3 Perennial	Maintain water quality (prevent entry of pollutants, minimize sediment loading and movement downstream, and maintain or reduce maximum summer stream temperatures).	Maintain high levels of biological, chemical, and physical functions.	Maintain riparian habitat for high levels of wildlife and native plant diversity.

Table 2-20. Riparian Management Objectives by Stream Type for Alternatives C, D, and E. (continued)

Stream Type	Water Quality Objectives	Stream Ecosystem Objectives	Riparian Ecosystem Objectives
Order 3 Perennial, fish stream or a major contributor of flow to a fish stream	Maintain or improve water quality (prevent entry of pollutants, prevent sediment loading and movement downstream, and maintain or reduce maximum summer stream temperatures).	Maintain or improve biological, chemical, and physical functions.	Maintain or improve riparian habitat for high levels of wildlife and native plant diversity.
Order 4+	Maintain or improve water quality (prevent entry of pollutants, prevent sediment loading and movement downstream, and maintain or reduce maximum summer stream temperatures).	Maintain or improve biological, chemical, and physical functions.	Maintain or improve riparian habitat for high levels of wildlife and native plant diversity.

Table 2-21. General Features of Silvicultural Systems - Proposed Resource Management Plan[1]

	Matrix Northern General Forest Management Area			Matrix Southern General Forest Management Area	Adaptive Management Areas[2]	Reserves (Late-Successional, Riparian	Other
Allocation	**In general**	**Connectivity/ Diversity Blocks**	**Frosts, pyroclastic soils[3], visuals**				
Silvicultural System	**Modified Even-Aged**	**Modified Even-Aged**	**Shelterwood Retention**	**Structural Retention**	**Structural Retention**	**Consistent with objectives**	**Consistent with objectives**
Features:							
Target stand	Large tree retention	Large tree retention	Large tree retention	Minimum ecological old growth	Varied	Ecological old growth	Varied
Target landscape	Mix of stand and seral conditions	Connectivity within allocation	Mix of stand and seral conditions	General connectivity	General connectivity	Functional arrangement	Varied
Harvest constraints	Reforestation	Landscape arrangement	Frost, soils, visuals	Reforestation, enhanced stand vigor	Reforestation enhanced stand vigor	N/A	N/A
Size of regeneration patch cuts	N/A	N/A	N/A	< 5 acres	Variable	N/A	N/A
Trees left/arrangement in regeneration harvest units	6-8 trees/ acre, scattered or grouped	12-18 trees/ acre, scattered or grouped	12-25 trees/ acre then 6-8 acre, scattered or grouped	16-25 trees/ acre scattered or grouped	16-25 trees/ acre scattered or grouped	N/A	N/A
Size of retained trees	20" +	20" +	20" +	Variable	Variable	N/A	N/A
Snag retention	40% habitat	40% habitat	40% habitat	40% habitat	40% habitat	As determined by subsequent analysis	Consistent with objectives

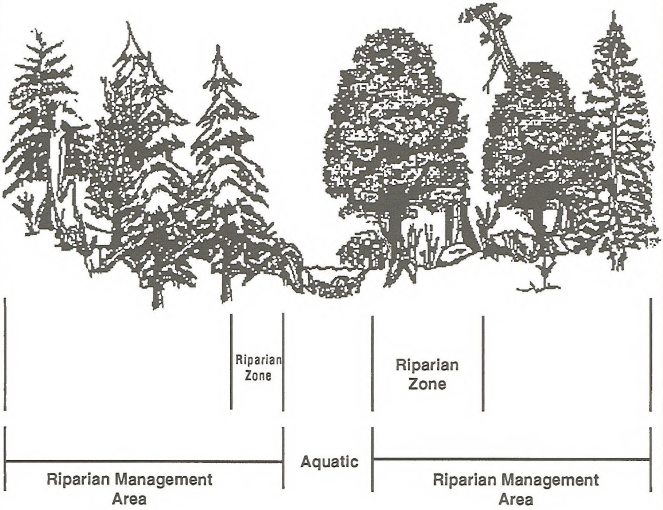
Table 2-21. General Features of Silvicultural Systems - Proposed Resource Management Plan[1]

	Matrix Northern General Forest Management Area			Matrix Southern General Forest Management Area	Adaptive Management Areas[2]	Reserves (Late-Successional, Riparian	Other
Allocation	**In general**	**Connectivity/ Diversity Blocks**	**Frosts, pyroclastic soils[3], visuals**				
Silvicultural System	**Modified Even-Aged**	**Modified Even-Aged**	**Shelterwood Retention**	**Structural Retention**	**Structural Retention**	**Consistent with objectives**	**Consistent with objectives**
Coarse woody debris		120 linear feet of material > 16 inches in diameter and 16 feet long				As determined by subsequent analysis	Consistent with objectives
Minimum regeneration harvests (years)	100	100	100	120	None	N/A	N/A
Interval between regeneration harvests (years)	100	150 (area control)	100	120	120	N/A	N/A
Provision for salvage	yes	yes	yes	yes	yes	yes	Consistent with objectives

[1] Future targets may vary based on the results of watershed analysis.

[2] Silvicultural system is generally expected to be one of structural retention. Management is expected to be similar to that of the southern GFMA. However, systems and practices as well as the resulting stands and landscape may vary to meet the objectives of the Adaptive Management Area. There are no specific standards and guidelines for snag and green-tree retention and coarse woody debris in the AMA, however, the intent of the Matrix standards and guidelines for these structures must be met.

[3] Granitics and schist soils would be managed under structural retention guidelines (southern GFMA).


Riparian Zone
Riparian Zone
Aquatic
Riparian Management Area
Riparian Management Area

Note: Illustration is not to scale.

Figure 2-1. *Riparian Management Areas*

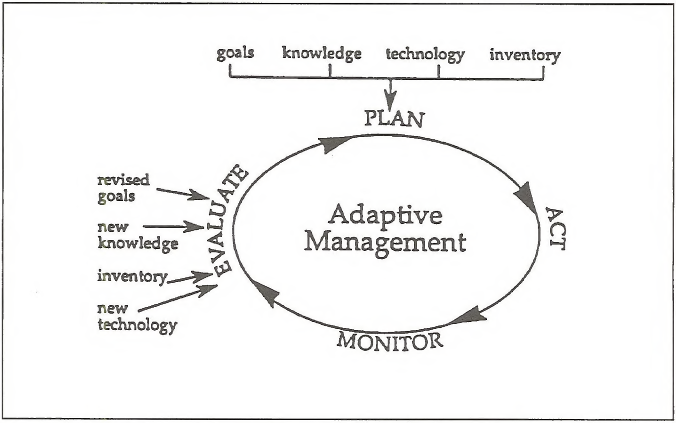

goals
knowledge
technology
inventory
PLAN
ACT
MONITOR
EVALUATE
Adaptive Management
revised goals
new knowledge
inventory
new technology

Figure 2-2. *Basic Adaptive Management Model*

Chapter 3
Affected Environment

Summary of Major Changes

Existing BLM stream condition in the Upper Illinois River basin was moved from Chapter 4 to Chapter 3.

Addition of Illinois River fall chinook salmon to the Special Status Species list.

Addition of small watersheds to Table 3-WA-1.

Deletion of the Watershed Condition Index.

Addition of wetlands narrative.

Addition of narrative on BLM-administered transportation system, public rights-of-way, administrative road closures, and identification of potential recreation opportunity spectrum semi-primitive management areas.

Addition of series and major plant grouping comparison in the Vegetation Section.

Expanded discussion of marbled murrelet biology and status within the planning area.

Combined Forest Health into Biological Diversity as Ecosystem Health.

Tables 3-SP-1 and 3-SP-2 have been combined with Appendix G.

This chapter describes the physical, biological, and socioeconomic characteristics of BLM-administered land as they now exist in the planning area. Resources that could be affected by BLM management alternatives are emphasized.

The primary sources of information used in preparing this chapter were BLM planning documents. The Analysis of the Management Situation and Resource Inventories are available for review at the Medford District Office. Other references are cited within the text by author and date of publication (see References Cited).

Climate

The Rogue, Bear Creek, Applegate, and Illinois valleys that dissect the planning area are the driest areas west of the Cascade Mountains in Oregon. The rain shadow effect created by the Siskiyou and Coast ranges results in relatively light annual rainfall, the majority of which occurs in the late fall, winter, and early spring. High temperatures in the summer months average slightly below 90°F, although extremes of 110°F have occurred as recently as 1990. High temperatures normally are accompanied by low humidity typical of a Mediterranean-type climate.

Precipitation amounts range from an annual average of 12 inches, in the more arid southeastern part of the planning area, to near 100 inches in the far northwestern part of the planning area.

Normal rainfall in Medford is 19.84 inches per year. Actual annual precipitation received since 1984 has been as low as 50 percent of normal. Portions of the planning area have gone without measurable precipitation for as many as 60 days during the summer.

The growing season in Medford averages about 170 days, extending from late April to mid-October. This decreases as elevation increases.

Prevailing winds are from the north or northwest and are usually light. Summer thunderstorm activity is common. Many of these storms are unaccompanied by measurable rainfall resulting in numerous lightning-caused fires. Winds in excess of 50 mph, from any direction, are common when these storms sweep across the area. Most of these storms enter the area from the south or southwest.

Topography and Geology

The Klamath and Cascade mountains are the two major geomorphic provinces in the planning area. They are dissected by the Rogue River basin.

Extensive erosion of the Klamath Province has created steep canyons with slopes averaging 55 percent. The Klamath Mountains are an ancient plane now dissected by the Rogue River drainage with most ridgetops at an elevation of 4,000 feet. The lowest elevations, about 500 feet above sea level, are along the Rogue River near Marial. The highest elevation in the planning area is 7,055 feet at Grayback Mountain.

In contrast, the Cascade Province is relatively flat but rising to 5,500 feet above the Bear Creek Valley forming a steep north-south ridge. It is composed of north-south trending volcanics that form the mountains on the east side of the planning area. The Cascade Mountains are tilted gently to the east descending to an elevation of 4,500 feet near Howard Prairie Lake.

The Klamath Mountains are pre-tertiary strata that have been folded, faulted, and, in places, intruded by granitic rocks and serpentinized masses of ultramafic rocks. These rock units are formed by the collision of the North American and Farallon plates. The Klamath Mountains are believed to be Paleozoic to Mesozoic in age. The structural trend strikes northeast and generally dips to the east. Major thrust faulting dips to the east with older rocks overriding younger rocks in the west.

The Cascade Mountains extend from northern California to British Columbia and are subdivided into the western and high Cascades. The western Cascades began erupting basaltic lava 43 million years ago forming a continuous chain of shield volcanoes that have built upon each other for more than 30 million years. The high Cascades form distinctive volcanic snow-capped cones like Mount McLoughlin. The high Cascade volcanoes are more andesitic in composition and began erupting four million years ago. Many of these steep-sided volcanoes have been deeply dissected by glaciers.

Lands and Transportation

Land Status

BLM-administered land is primarily in a checkerboard-ownership pattern. BLM-administered land in the planning area covers portions of five counties (see Table 1-1).

Land Tenure

Since 1984 there have been nine land actions affecting BLM-administered acreage. Lands have been acquired through exchange and disposed of through exchange and sale. This resulted in the acquisition of 360 acres and disposal of 540 acres.

Currently there are 11 exchange proposals which, if implemented, could result in the exchange of approximately 4,500 acres of BLM-administered land for approximately 8,100 acres of nonfederal land. Inquiries and verbal proposals are received regularly.

The State of Oregon holds title to the beds and banks of all navigable waters in the state. The Division of State Lands administers these lands. The lower Rogue River which adjoins BLM-administered lands in the Medford District has been determined to be navigable.

The state could in the future assert claims, based on navigability, to the upper Rogue River and to the Applegate River.

The State of Oregon is entitled to select 5,202.29 acres of public domain lands for in-lieu selection within the entire State of Oregon. The Medford District would accommodate all or a portion of the state's selection within the requirements of applicable law and BLM policy.

Withdrawals and Classifications

Withdrawals and classifications existing in the planning area are listed in Table 2-5. Withdrawals generally segregate land from operation of the general land laws and mining laws but do not affect surface management. Several withdrawals existing in 1984 were terminated during the review process mandated by the Federal Land Policy Management Act (FLPMA). Sixteen withdrawals remain to be reviewed.

The only classifications in the planning area involve lands classified for recreation and public purposes. These classifications segregate lands from all forms of appropriations under the public land laws including the mining laws but not the mineral leasing laws.

Right-of-Way Corridors and Major Rights-of-Way

Rights-of-way are granted for residential, logging or access roads, domestic and irrigation water lines, and utility lines for servicing residences. The vast majority of utility lines are within or adjacent to road clearing limits.

Existing right-of-way corridors include Bonneville Power Administration and private utility transmission lines (see Map 3-1). Two potential new corridors that would affect BLM-administered land in the planning area have been identified (Clayton 1986). However, information provided by Bonneville Power Administration identifies no new corridors. The future upgrading of existing transmission lines is probable and may require additional right-of-way width.

There are six applications for permits filed with the Federal Energy Regulatory Commission to authorize hydroelectric projects in the planning area. Solar and wind electrical generation has not occurred on BLM-administered land. Advances in technology during this planning period could increase interest in developing alternative energy resources.

Communication Sites

Nineteen communication sites are located in the planning area. Most have numerous users occupying each site (see Map 3-1).

Roads

There are 4,455 miles of BLM-administered roads in the planning area (see Table 3-L-1). Historically, roads were constructed, improved, and maintained to support timber management activities. In addition to timber management, roads now provide access for removal of other forest products, recreational use, mineral exploration and development, and access to rural homes.

Approximately 55 miles of road are constructed, and 52 miles are improved annually. Each year, approximately 1,250 miles of road are maintained by BLM and another 300 miles are maintained by purchasers of timber sales.

Currently, 415 miles of road are closed to public use year around; another 365 miles are closed seasonally (winter and early spring). These road closures usually include short, dead-end roads classified as minor collector, and local roads constructed for individual timber sales, and represent approximately 20 percent of the BLM-administered transportation network. These administrative actions are not off-highway vehicle (OHV) allocations. The roads are normally gated or barricaded and closed to reduce maintenance costs or to protect other resource values such as wildlife. Many other roads are closed by natural vegetation regrowth. These roads are included in the present inventory but are not specifically identified as closed.

Existing roads occupy approximately 24,000 acres of BLM-administered land in the planning area. Easements and/or reciprocal right-of-way agreements provide physical access to approximately 90 percent of BLM-administered land in the planning area for management activities.

This access is for resource management and in most cases does not include rights for the public.

An integral part of the transportation system is the 72 bridges and 97 major culverts (more than 35 square feet end area) located at road crossings of larger streams.

Air Resources

The Clean Air Act, as amended, directs the State of Oregon to meet or exceed national ambient air quality standards by 1994. The Oregon Smoke Management Plan (OSMP), a part of the required State Implementation Plan, identifies strategies for minimizing the impacts of smoke from prescribed burning on the densely-populated, designated, nonattainment and smoke sensitive areas within western Oregon and the Bend area in central Oregon (see Map 3-2). Particulate matter with a nominal size of 10 microns or less (PM10) is the specific pollutant addressed in the State Implementation Plans.

The Visibility Improvement Plan, which is also part of the State Implementation Plan, considers the impacts smoke from prescribed fire may have on visibility within the Class I areas of designated wilderness areas and Crater Lake National Park. The Class II areas shown in Map 3-2 are eligible to be upgraded to Class I status by the state, but to date have not been.

The population centers of Eugene/Springfield, Oakridge, Grants Pass, Medford/Ashland, Klamath Falls, and LaGrande are currently in violation of the national ambient air quality standards for PM 10 and are classified as nonattainment areas for this pollutant. Nonattainment areas influenced by prescribed fire are Grants Pass, Klamath Falls, and the Medford/Ashland air quality management area (Medford, Ashland, Central Point, and portions of Eagle Point).

The nonattainment status of these communities is not attributable primarily to prescribed burning. Major sources of particulate matter within the Medford/Ashland nonattainment area is smoke from woodstoves (63 percent), dust and industrial sources

Table 3-L-1. Road Inventory[1]

Surface Type	Arterial[2]	Collector[3]	Local[4]	Single Lane[5]	Double Lane
Natural	1	31	1,075	1,107	0
Pit run	28	105	626	759	0
Grid rolled	1	19	342	362	0
Screened base	0	0	17	17	0
Aggregate base	18	146	626	790	0
Aggregate surface	89	366	626	1,081	0
Bituminous surface	203	83	53	309	30
Crushed sandstone	0	0	0	0	0
Total	340	750	3,365	4,425	30

[1] Includes BLM-controlled roads and privately-controlled roads with BLM improvements as of October 1, 1988.
[2] Arterial Roads: These roads provide service to large land areas and usually connect with public highways or other arterial roads to form an integrated network of primary travel routes. The location and standard of arterial roads are often determined by a demand for maximum mobility and travel efficiency rather than specific resource management service. They are developed and operated for long-term land and resource management purposes and constant service.
[3] Collector Roads: These roads serve smaller land areas and usually are connected to an arterial road or public highway. They collect traffic from local roads or terminal facilities. The location and standard of collector roads are influenced by long-term multi-resource service needs, as well as by travel efficiency. Collector roads may be operated for either constant or intermittent service, depending on land use and resource management objectives.
[4] Local Roads: These roads connect terminal facilities of: trailheads, landings, viewpoints, wayside stops, parking spurs, or comfort stations to collector or arterial roads or public highways. The location and standard of local roads are determined by the need to serve a specific resource activity or project rather than travel efficiency. Local roads may be developed and operated for either long- or short-term service.
[5] Single lane consists of arterial, collector, and local.

(18 percent). The contribution to the nonattainment status of particulate matter from prescribed fire is less than four percent of the annual total for the Medford/Ashland air quality management area (DEQ 1991).

Two other sources of pollution are directly attributable to land management activities: fugitive dust and aerosol herbicides (see Appendix 1-D, Draft RMP).

The pollutant most associated with the Medford District's resource management activities is PM10 found in smoke produced by prescribed fire. Prescribed fire is used for site preparation, fuel hazard reduction, vegetation control, and to mimic natural ecosystem disturbance processes.

The goal of the OSMP is to reduce particulate matter emissions from prescribed burning by 50 percent by the year 2000 for all of western Oregon. Current data indicates particulate emissions have been reduced approximately 42 percent since the baseline period was established (ODF 1991). It is expected this trend will continue and prescribed fire smoke emissions will not be a consideration in meeting air quality standards for PM10 in western Oregon.

A primary reason for the emission reduction levels from the calculated baseline period of 1976 to 1979 is the steady decrease in the total tons per acre consumed (see Table 3-A-1). For the planning area the average annual prescribed fire fuels consumption rate per acre during the baseline period was approximately 51 tons per acre from approximately 1,600 acres. There were few prescribed fires prior to 1980 in the planning area. During 1980 to 1984, the consumption rate was 45 tons per acre from an average of 3,485 acres. The present consumption rate, as represented by the period 1985 to 1988, is 19 tons per acre over an average of 4,365 acres. This reduction in total tons consumed has a direct proportional effect on the amount of particulate matter produced.

Current total biomass consumption has been reduced by 62 percent from the 1984 to 1988 baseline period. The variation in acres burned and total emissions is a result of weather, smoke management restrictions, and the economic cycles that affect timber harvest.

When burning under spring-like conditions, larger fuels are not consumed due to higher fuel moistures. Fuel consumption is lower, creating fewer emissions, with smoke dispersal easier to achieve under the general meteorological conditions that prevail at this time.

The use of advanced ignition techniques such as aerial firing further reduce total emissions by accelerating the ignition period and reducing the total combustion process due to the reduction in the smoldering stage. The use of aerial ignition allows burning under wetter fuel conditions allowing less material to be burned, especially the soil-protecting duff layer which also reduces total emissions.

Hand and machine piling of slash has allowed selective burning of woody debris during late fall and winter but only under weather conditions that allow optimal smoke dispersion. Burning of properly piled material is generally a more efficient method of combustion that allows for scheduling of burning when snow and adjacent water-saturated fuels reduce the risk of an escaped prescribed burn.

Alternatives to burning have helped reduce emissions. These include removal of heavy boles and large limbs for use as secondary wood products, power generation, and firewood.

Smoke entering a designated area from a prescribed fire is called an intrusion. Intrusions are classified from light to heavy. From 1987 to 1989, an average of 25 intrusions occurred per year in western Oregon. These intrusions were generally light to moderate in intensity and of short duration (ODF 1991). There were two intrusions into the Medford/Ashland and Grants Pass designated areas attributed to prescribed fire in the planning area during 1984 to 1988 (see Table 3-A-2).

Historically, most intrusions have been associated with inaccurate wind direction forecasts, burning too many timber harvest units too close together, or burning too late in the day allowing residual smoke to flow into the designated area.

Not all timber harvest units require treatment by prescribed fire. Of the average annual slash acres created by timber harvest activities in the planning area during the period 1984 to 1988, only 51 percent of the total slash acres created were actually treated with some form of prescribed burning (see Table 3-A-3).

In some instances the only required treatment permitted for site preparation is by mechanical or physical means due to the concern for smoke impacts. However, no treatment or mechanical treatment does not reduce the amount of available fuel and results in a higher fuel hazard which increases the risk of wildfire.

Emissions from wildfires are significantly higher than from prescribed burning. The wildfires in southern Oregon in 1987 emitted as much particulate matter as all the burning that occurred within the state that year.

Table 3-A-1. Average Biomass Consumption Estimates

	Calculated Baseline (1976-79) Average Consumption			Calculated (1984) Average Consumption			Planning Area (1989) Average Consumption		
Category	**High**	**Mid**	**Low**	**High**	**Mid**	**Low**	**High**	**Mid**	**Low**
		(tons per acre)			*(tons per acre)*			*(tons per acre)*	
Duff[1]	18.2	16.6	14.9	18.2	12.9	9.1	9.1	2.7	1.9
Woody <3"	25.1	22.0	18.3	20.1	17.6	15.0	15.1	13.3	11.0
Woody >3"	7.0	6.1	5.1	5.6	4.9	4.1	2.4	2.4	2.0
Rotten	1.0	1.0	1.0	1.0	1.0	1.0	.8	.8	.8
Total	**51.3**	**45.7**	**39.3**	**44.7**	**33.2**	**29.0**	**27.4**	**19.3**	**15.6**

[1] Sandberg's figures for an average forest duff layer of one inch in western Oregon is equal to 18.2 tons per acre. For the planning area, one inch of duff was estimated. This does not mean total consumption which varies based on season of burn. It is expressed in the planning area's adjusted consumption (Sandberg et al. 1985).

Table 3-A-2. Smoke Intrusions in the Medford/Ashland and Grants Pass Designated Area from All Landowners

Year	Number of Smoke Intrusions Total	Number of Smoke Intrusions BLM	Number of Days
1984	3	0	3
1985	9	0	9
1986	2	0	2
1987	3	2	6
1988	2	0	6
Total	**19**	**2**	**26**

SOURCE: ODF 1977-1985

Table 3-A-3. Prescribed Fire Use Based on Total Available Harvest Acres

Year	Harvest Acres	Prescribed Fire Acres	Percent of Total
1984	8,609	4,449	52
1985	8,231	5,014	61
1986	7,783	5,375	69
1987	10,812	4,576	42
1988	9,252	3,189	34
Total	**44,687**	**22,603**	**51**

Air quality impacts from woodheating in residential areas are different than those associated with prescribed burning of logging slash. Most of the wood that is burned as firewood comes from the surrounding forestland. As a consequence, air quality impacts shift from generally higher elevations, which are more favorable to smoke dispersion and remote from other air pollution sources, to lower elevations with less air movement and in closer proximity to other pollution sources. Woodstoves contribute to both health and visibility concerns. Smoke particles emitted from incomplete combustion of wood may have relatively high concentrations of known and suspected carcinogens.

Winter air stagnation, causing air pollution from woodstoves, is an increasing problem in the Medford/Ashland air quality management area. Firewood, burned during the winter when colder air and temperature inversions occur, traps and concentrates wood smoke in the valleys.

Between November 15 and February 15, county and city woodstove curtailment programs restrict woodstove use on days when air stagnation exceeds established standards. All prescribed burning during these "yellow and red" days must be above the valley inversion level and not contribute to the air pollution levels in the valley. Temperature inversions which keep pollutants trapped within the valley exclude prescribed smoke from entering from above.

Soil

Soil is a highly variable and complex layer of unconsolidated material. It consists of air, water, chemicals, gases, organic material, living organisms, and rock fragments. Soil is a fundamental component of the environment upon which all renewable resources depend. The combined influences of time, type of rock, climate, living organisms, and topography of a site interact to form a soil with a unique set of characteristics. These characteristics determine the productivity and management requirements of each soil.

Soils store and deliver water to streams and lakes as well as provide a medium for plant growth. Soil productivity is a measure of a soil's ability to produce vegetation. Vegetation growth requires adequate moisture, air, nutrients, and soil for anchorage. Organic matter content, nutrients, organisms, texture, structure, porosity, and depth are important for vegetative growth. These properties are influenced by soil displacement, compaction, erosion, and organic matter removal.

Soil or site productivity depends on physical and chemical characteristics, organic matter accumulation, and a community of soil organisms existing in dynamic equilibrium. Productivity depends on maintaining the transfer of energy from surface plants to soil organisms, nutrient cycling, nitrogen fixation, and symbiotic relationships between organisms. Nitrogen is the major growth-limiting nutrient in the Pacific Northwest, however, deficiencies in phosphorus, potassium, magnesium, sulfur, zinc, or boron can also reduce growth (Edmonds et al. 1989).

Organic matter decomposition and subsequent nutrient release play a large role in regulating productivity. Retention of organic matter is especially important in maintaining long-term productivity in less productive soils. Mycorrhizae enhance nutrient uptake by increasing the surface area around the tips of roots. Retention of needles, leaves, and twigs is important because they contain the highest concentrations of nitrogen. Removal of stemwood and branches, when compared with small materials, has less effect on total nitrogen. However, large woody materials store water and are a reservoir for mycorrhizae and soil organisms thereby contributing to long-term productivity.

Soil distribution and characteristics have been collected by Soil Conservation Service and BLM, and is available at the Medford District Office. The Soil Conservation Service has mapped 28 soil associations in the planning area using soil, climate (temperature and precipitation), landform, vegetation, and geologic data.

The soils in the planning area have a wide range in texture, depth, rock content, and mineralogy due to the complex geology in southwestern Oregon. The Siskiyou Range, the Western Cascade Mountains, and the high Cascades are the three identified geomorphic provinces that have contrasting soils. Soils in the Siskiyou Range, north and west of the Rogue Valley, have been derived from metamorphic and acid igneous rocks. Surface textures are dominantly loams and sandy loams with high rock content, especially on the steepest slopes. Granitic soils, derived from acid igneous rock, are susceptible to surface erosion. Narrow bands of serpentine bedrock have cobbly, clayey soils with a distinct vegetative community composed mainly of scattered Jeffrey pine and grasses. When vegetation is removed, it is often difficult to reestablish because of a nutrient imbalance. Most of the soils in the Western Cascade Mountains have developed from volcanic tuffs and breccias and have large amounts of high shrink-swell clays. Some soils are subject to slumping when disturbed by road construction. Soils in the high Cascade Mountains have formed mainly from andesite and other basic igneous rocks. Textures are dominated by low shrink-swell clays on gentle slopes. Ridges have soils with stony, loam textures. All soils in the planning area are assumed to be susceptible to soil compaction.

An intensive inventory, timber production capability classification (TPCC), identified fragile sites where timber-growing potential is easily reduced due to inherent soil properties and landform characteristics (see Appendix 3-T-1, Draft RMP).

There are more than 33,000 acres of fragile forest sites judged to be biologically and/or environmentally incapable of supporting a sustained yield of forest products (see Table 3-S-1). These lands are excluded from planned timber harvest.

Almost 144,000 acres of forest sites are less fragile than the fragile nonsuitable woodland acres (see Table 3-S-2). These sites are judged to be fully capable of being managed for timber production and other surface disturbing activities without site deterioration or offsite impacts when best management practices (BMPs) are utilized to protect them (see Appendix F).

Approximately 37,000 acres have been burned with prescribed fire from 1980 to 1988. Monitoring of units burned in 1988 found 10 percent were burned at such an intensity that organic matter was substantially reduced. Wildfires, however, burned approximately the same acreage during 1987 and 1988 as prescribed fire had burned in nine years. The percentage of intensely burned areas during wildfire, compared to prescribed burning, has been much higher due to very dry fuels and extreme weather conditions.

Since 1986, when harvest-system record keeping began, approximately 24 percent of the harvested acreage has been yarded with a crawler tractor. Beginning in 1980, designated skid trails have been utilized to reduce the amount of soil compaction and limit productivity losses. Estimated productivity losses range from 0.8 percent in the Josephine sustained yield unit (SYU) to 1.6 percent in the Jackson/Klamath SYU. The figures are based on the percentage of acres harvested by tractors and the anticipated amount of soil compaction. Soil tillage has been utilized to reduce productivity losses on some skid trails and in areas where machine piling has occurred. The extent of compaction from cable yarding depends on the amount of suspension achieved during yarding and the water content of the soil. The impacts of cable yarding on productivity have not been documented but are estimated to be less than tractor yarding due to log suspension and less vehicular traffic.

Mining, grazing, and recreation activities such as off-highway vehicle (OHV) use have contributed to soil productivity losses. Soil has been partially or completely removed from areas during mining operations. Concentrations of livestock around water holes, riparian areas, and salt licks have caused soil compaction and erosion. OHV use has caused soil compaction and erosion. The impact of these activities on soil productivity is minimal compared to

Table 3-S-1. Fragile Nonsuitable Woodland

Category	Acres	Percent BLM Forestland
Nutrient	5,968	<1
Slope gradient	23,499	3
Mass movement potential	638	<1
Surface erosion potential	1,906	<1
High water table	1,422	<1
Total	**33,433**	**4**

Table 3-S-2. Fragile, Suitable Commercial Forestland

Category	Acres	Percent BLM Forestland
Nutrient	9,935	1
Slope gradient	52,874	7
Mass movement potential	32,691	4
Surface erosion potential	46,107	6
High water table	2,350	<1
Total	**143,957**	**18**

forest management activities such as road construction, timber harvest, and site preparation.

Monitoring to determine impacts of timber harvest activities on soil began in 1986. Tractor-harvested units are examined to determine the amount of area compacted. Cable harvested units are reviewed to determine organic matter retention following yarding and broadcast burning. Harvested units and roads are examined to determine the extent of surface erosion and landsliding following road construction and timber harvest. Most surface erosion and landsliding result from road construction. Based on these observations, threshold levels, as established in the monitoring handbook, have been exceeded less than 10 percent of the time.

Water Resources

State water use programs identify the use and control of water resources for each river basin and promote the maximum beneficial use of the waters of the state (OWRD 1992). State water quality standards designed to protect beneficial uses are described in Oregon Administrative Rules (OAR), Chapter 340 (DEQ 1992a). Beneficial uses include, but are not limited to, domestic water supply, fish and aquatic life, recreation, and wildlife.

Watershed Descriptions

The planning area includes parts of three river basins: the Rogue, Umpqua, and Klamath. These river basins are divided into 33 analytical watersheds. Analytical watersheds are selected according to topography and size; they range in size from approximately 30,000 to 242,000 acres (see Map 3-WA-3).

Analytical watersheds are identified to display existing watershed conditions. Many of the analytical watersheds extend beyond the planning area boundaries; information on watershed condition is not readily available in those areas. Analytical watersheds are subdivided into subwatersheds. Subwatersheds generally range in size from 3,000 to 20,000 acres. Subwatersheds are divided into smaller watersheds that are various size, but are generally less than 5,000 acres, for project level analysis.

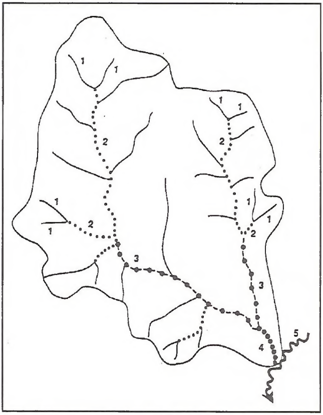
There are eight community water systems that use surface water from watersheds in the planning area (see Appendix 3-WA-4, Draft RMP). These watersheds are referred to as community watersheds (see Map 3-4). Bear Creek and two tributaries, Ashland and Wagner Creeks, supply community water systems and are designated by the Oregon Department of Environmental Quality (DEQ) as "water quality limited" (see Water Quality). BLM currently has no formal community watershed agreements. However, the Butte Falls Resource Area is working with the town of Butte Falls to develop a community watershed agreement for protection of their ground water source (see Appendix Map 3-WA-5, Draft RMP). Based upon existing plans and coordination with affected communities, BLM has not provided special management prescriptions to ensure water quality for the express purpose of protecting water supplies over and above standard management practices.

Rivers, Streams, Lakes, and Wetlands

The stream order system (Strahler 1957) has been adopted for this planning process (see Riparian section for miles and condition of stream by stream order). Unbranching headwater stream channels are referred to as first order streams; the joining of two first order streams creates a second order stream; two second order streams combine to form a third order, and so forth (see Figure 3-WA-1).

Streams in the planning area currently are managed according to their class, as determined by beneficial use and stream characteristics. There is no direct correlation between stream class and stream order.

Field inventory information for stream channel stability and condition is unavailable for the entire planning area (see Figure 3-WA-2). This information is obtained as needed for evaluating the impacts of timber sales or other management activities. Channel stability is a function of side slope steepness, soil type, density of riparian vegetation, amount of large woody debris, and streambank stability. Channel condition depends on the amount of streambank erosion, degree of scouring, and bedload and sediment loading.


1
1
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5

***Figure 3-WA-1.** Stream Order System for a Watershed. (Meyers 1989)*

First and second order streams in the planning area have a major influence on downstream water quality since they comprise approximately 75 percent of the total stream miles in the planning area. Beneficial uses supported by these streams include aquatic species and wildlife. Most first and second order streams in the planning area are characterized by intermittent stream flow, however, 7 percent are estimated to be perennial. These stream channels are generally very narrow and V-shaped with steep gradients. Large woody debris, which dissipates

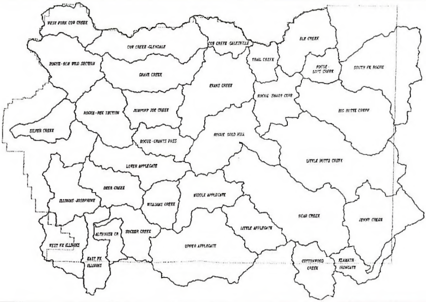

WEST FORK COW CREEK
COW CREEK-GLENDALE
COW CREEK-GALESVILLE
ELK CREEK
ROGUE-BLM WILD SECTION
GRAVE CREEK
TRAIL CREEK
ROGUE-LOST CREEK
SOUTH FK ROGUE
EVANS CREEK
ROGUE-SHADY COVE
ROGUE-REC SECTION
JUMPOFF JOE CREEK
BIG BUTTE CREEK
SILVER CREEK
ROGUE-GRANTS PASS
ROGUE-GOLD HILL
LITTLE BUTTE CREEK
LOWER APPLEGATE
DEER CREEK
MIDDLE APPLEGATE
ILLINOIS-JOSEPHINE
WILLIAMS CREEK
BEAR CREEK
JENNY CREEK
ALTHOUSE CR
SUCKER CREEK
LITTLE APPLEGATE
WEST FK ILLINOIS
UPPER APPLEGATE
EAST FK ILLINOIS
COTTONWOOD CREEK
KLAMATH-IRONGATE

***Figure 3-WA-3.** Analytical Watersheds*

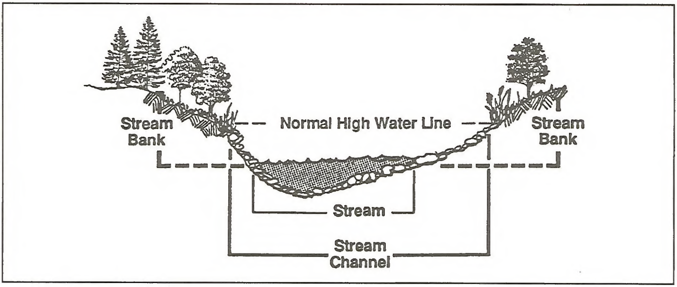


Figure 3-WA-2. Stream Channel Profile

stream energy and slows channel erosion, is a key component of these headwater streams. The amount of large woody debris in first and second order streams in the planning area has been greatly reduced as a result of harvest and prescribed burning. This loss of woody debris contributes to reduced channel stability and increased sediment movement downstream during storm events.

Third and fourth order streams comprise 19 percent of the stream miles in the planning area. Many of these streams support fish or directly contribute to the water quality of fish-bearing streams. Third and fourth order streams in the planning area are generally perennial, fairly narrow, have stream gradients less than 5 percent, and have U-shaped channels. During winter storms, these streams can move large amounts of sediment, nutrients, and woody material. Channel condition of these streams varies and depends upon the inherent channel stability and past management practices in the watershed. The amount of large woody debris contributed to these streams has been reduced by management practices in the riparian areas.

Fifth order and larger streams make up 6 percent of the stream miles in the planning area. These streams support fish as well as other beneficial uses. Fifth order and larger streams tend to be wider, have flatter gradients, and a noticeable floodplain. Flood events play a major role in the channel condition of these larger streams. Protection of stream reaches during management activities on BLM-administered land has been sufficient to maintain channel condition. However, actions on adjacent upland areas and on non-BLM-administered land have adversely affected some of these stream segments.

Mature stands of trees along fifth order and larger streams on BLM-administered land generally contain trees of sufficient size to provide a future source of large woody debris. However, past practices such as salvage logging from stream channels, leaving inadequate numbers of conifers in riparian areas, and removing debris jams to improve fish passage have reduced the amount of large woody debris in fifth order and larger streams.

Natural lakes in the planning area include Lost and Sharon lakes in the Little Butte Creek watershed and Parsnip Lakes in the Jenny Creek watershed. Howard Prairie, Hyatt and Little Hyatt lakes, and Keene Creek Reservoir in the Klamath River basin are interconnected by a series of canals. This system discharges into Emigrant Lake reservoir in the Rogue River basin.

Reservoirs in the planning area are listed in Appendix 3-WA-6, Draft RMP. Applegate and Agate reservoirs have little BLM-administered land in their watersheds.

Wetlands comprise a variety of aquatic vegetated systems including, but not limited to, sloughs, swamps, marshes, bogs, lakeshores, wet meadows, and vernal pools. Wetland locations in the planning area are listed in Appendix 3-VEG-1, Draft RMP.

Wetlands provide many important ecological functions such as: critical habitat for many plants and wildlife species; spawning and rearing habitat for fish; absorption and storage of water during high runoff periods to reduce flooding; accumulation areas for sediments, preventing their entry into other waterways; and slow release of stored water to augment summer streamflow.

Springs also provide important wildlife habitat and are valuable sources of cool, clean water. For planning purposes, springs are treated as special habitat (see Wildlife section).

Ground Water

Ground water supplies in most areas of the Umpqua and Rogue basins are limited. There is a lack of baseline information to assess the current status of ground water quantity or quality (OWRD 1985; OWRD 1989). Complex geology in the Rogue Valley makes locating an adequate supply of ground water difficult. There has been increased demand in Jackson County on ground water reserves as the rural population density increases. Recent years of below normal precipitation have resulted in reduced recharge of ground water supplies.

Well water quality problems are prevalent throughout the Rogue Valley. Surface contaminants such as nitrate and fecal matter may enter ground water through improperly constructed wells. Undesirable contaminants from underground natural sources such as arsenic, boron, or fluoride dissolved in ground water may be present. Wells with high concentrations of chloride have been reported in Josephine County.

A study, begun in 1989, collected information on ground water in Jackson County by the USGS in cooperation with Jackson County. No results are available.

Ground water uses include irrigation, domestic, and municipal. Wells on BLM-administered land are used for the Charles A. Sprague Seed Orchard, Hyatt Lake, Little Applegate, and Gold Nugget recreation sites.

Water Quantity

Streamflow fluctuates with seasonal variation in precipitation. Approximately 80 to 90 percent of annual water yield in the Rogue basin occurs during the six month period from December through May. Runoff during this period varies from small increases in stream flow to major floods. Precipitation, water yield, and streamflow vary across the planning area (see Appendix 3-WA-7, Draft RMP).

The summer low flow period occurs from July through October and reflects the low rainfall during this period. Below normal precipitation in the planning area from 1985 through 1991 has contributed to extremes in low flows. Watersheds without regulated streamflows experience very low summer flows. The Umpqua and Rogue River Basin Program Reports (OWRD 1985; OWRD 1989) recognize water supplies are inadequate in many areas during time of need.

The time of greatest water need occurs during the summer months when water is in high demand for irrigation, recreation, domestic use, road construction, and power generation. This is also the time of lowest water yield. Naturally low summer stream flows are directly affected by withdrawals for agriculture and domestic use. The result is seriously depleted streamflows which affect instream fish habitat.

Many water rights have been filed for surface and ground water within the planning area. Water rights for the Klamath River basin currently are being adjudicated.

Many watersheds within the Rogue River basin have been designated areas of restricted use (OWRD 1989). Restrictions range from total withdrawal from water appropriation to withdrawal from all but domestic and irrigation uses. An Oregon Supreme Court decision (Diack vs. City of Portland 1988) further restricted water appropriations. The Diack decision resulted in postponement of water right application processing within or upstream from a state scenic waterway until determinations are made for streamflows necessary for recreation and fish and wildlife uses within the scenic waterways. Scenic waterway flows for the lower Rogue and Illinois rivers were approved in October 1991. Water right permits are being granted on a case-by-case basis.

An increase in rural population density has been accompanied by an increase in surface and ground water diversion. This trend is expected to continue during the next ten years.

BLM has water demands for a variety of resource programs and is required to comply with applicable state water right laws in managing and administering all BLM programs and projects. Water uses include: recreation, fisheries, wildlife, livestock, prescribed fire, dust abatement, and road construction. Depleted streamflows and restrictions on water appropriations within many Rogue River subbasins have constrained BLM's ability to acquire state water rights for activities critical to BLM resource management such as prescribed fire, dust abatement, and road construction.

Water Quality

The objective of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the Nation's waters and to protect designated beneficial uses. Authority to implement the CWA in Oregon is delegated to DEQ. The BLM is the designated management agency charged with implementing and enforcing natural resource management programs for the protection of water quality on lands under its jurisdiction. A memorandum of agreement (MOA) between BLM and DEQ, signed in 1989, delineates BLM's responsibilities and activities concerning implementation of Oregon's nonpoint source pollution control program. The MOA recognizes nonpoint source water quality problems are best controlled through the development, adoption, and implementation of sound resource management practices referred to as best management practices (BMPs). BLM implements resource management practices which meet the state's BMPs for controlling nonpoint source pollution.

DEQ prepared a statewide assessment of nonpoint sources of water pollution (DEQ 1988a). Waterbodies in the planning area identified by DEQ as having serious nonpoint source pollution problems are listed in Appendix 3-WA-8, Draft RMP. Pollution problems frequently identified for these streams include turbidity, sediment, streambank erosion, insufficient stream structure, and low flow. Land use associated with serious pollution problems include irrigation, harvest, road construction, instream mining, grazing, and natural conditions.

Waterbodies where water quality does not meet applicable water quality standards, and/or is not expected to meet applicable water quality standards, even after the application of the technology based effluent limitations required by the CWA are designated by DEQ as "water quality limited".

The CWA requires establishment of total maximum daily loads (TMDL) for all water quality limited streams. A TMDL is equivalent to the greatest amount of pollution a waterbody can receive without violating water quality standards (DEQ 1992b). Streams in the planning area identified by DEQ as water quality limited include, Bear Creek (and its' tributaries), Little Butte Creek, and Evans Creek (DEQ 1992b).

Bear Creek watershed in the Rogue basin is 239,239 acres, of which 26,316 acres (11 percent) are BLM-administered. A proposed TMDL has been recommended for biochemical oxygen demand (BOD) and total phosphorus. Suspected causes affecting beneficial use in Bear Creek are municipal point sources, agriculture, on-site septic tank/drainfield systems, and urban and residential runoff (DEQ 1992b).

Little Butte Creek watershed in the Rogue basin is 241,883 acres, of which 55,633 acres (23 percent) are BLM-administered. Violations of bacteria and dissolved oxygen standards caused designation of Little Butte Creek as water quality limited. Further review of Little Butte Creek data is necessary before DEQ would propose waste load allocations. Potential sources affecting dissolved oxygen levels are natural background levels and municipal point sources (DEQ 1992b). Agriculture is the suspected cause of high bacteria levels (DEQ 1992b).

Evans Creek watershed in the Rogue basin is 143,303 acres, of which 58,754 acres (41 percent) are BLM-administered. Evans Creek is water quality limited due to elevated bacteria levels caused by agricultural sources (DEQ 1992b).

Water quality of streams on BLM-administered land in the planning area is generally good and supports a variety of beneficial uses. Principal water quality concerns are above-optimum water temperatures for salmon and trout in the summer, high turbidity and sedimentation during major winter storms, and lack of stream structure.

Timber sale monitoring conducted during the 1980s determined whether:

- environmental assessments were in compliance with BLM policy and state and federal law,
- BMPs were carried forward into the timber sale contract,
- BMPs were implemented according to design,
- BMPs were effective in meeting design expectations and in attaining water quality standards, and
- mitigation minimized impacts from activities where BMPs did not perform as expected.

Since 1981, approximately 10 percent of timber sales have been monitored annually. Monitoring for BMP effectiveness in the early 1980s revealed elevated water temperatures on several small, perennial, nonfishery streams in harvest units where shading vegetation had been removed. These findings resulted in modification of timber sale design features along perennial, nonfishery streams to assure maintenance of stream temperatures. No temperature increases have been observed for streams in harvest units incorporating the modified shade protection prescription.

Elevated water temperatures are of concern throughout the planning area (USDI, BLM, MDO 1981, 1982, 1988; DEQ 1988a), and can be attributed to a combination of factors including low summer flows, water withdrawals, wide channels, stream orientation, geology, and lack of streamside vegetation.

Water clarity is the most visible characteristic of water quality and it is affected by suspended sediment. Sediment concentrations and resultant turbidity are the water quality attributes most readily and frequently influenced by natural events and human activity. Forestry practices may influence the amount of sediment entering streams by causing surface erosion or landslides. The occurrence of surface erosion or landslides resulting from forest management activities depends on natural rates of surface erosion and landslide frequency, climatic factors, and the type of activity. There are very few landslide-prone areas in the planning area. Areas having unstable soils and subject to landslides were inventoried in the timber production capability classification (TPCC) and are excluded from timber harvest and road construction.

Roads continue to be a major source of stream sedimentation, although improved methods for design, location, and construction have greatly reduced sedimentation from this source.

The state criterion for turbidity in the Rogue, Umpqua, and Klamath basins allows no more than a 10 percent cumulative increase in natural stream turbidities from a control point immediately upstream from the turbidity-causing activity. Currently, no state criterion exists for suspended sediment. Water monitoring for turbidity upstream and downstream from several harvest units during the 1980s did not show any violation of the turbidity criterion.

Upland Conditions

Land and water management are integrally related. The quantity and quality of water in a stream system directly depends on the nature and management of its watershed (OAR 690-41-050). Upland conditions result from climate, geology, soil, topography, vegetation, and land management activities in addition to natural events occurring in a watershed such as wildfires, floods, windstorms, and landslides.

Several watersheds in the planning area have a high potential for water quality degradation due to natural or human-caused upland conditions.

Snow, Sugar,and Meadow Creeks (Cow Creek-Galesville), North Fork of Louse Creek (Jumpoff Joe Creek), upper portions of Williams Creek, West and East Forks of Evans Creek, Pleasant Creek (Evans Creek), and headwaters of Birdseye and Savage Creeks (Rogue-Gold Hill) watersheds have fragile soils formed from decomposed schist and/or granitic parent material on steep slopes. These soil types are typically high in sand content and low in organic matter. Consequently, they are subject to severe surface erosion which can supply high volumes of sediment to tributary streams (see Map 3-5).

Most soils in West Fork of Trail Creek watershed have formed in deeply weathered pyroclastic parent materials and have a high potential to degrade water quality. These soils are very high in clay content, can be unstable, and are subject to slumping and cracking. When these high shrink-swell clay soils enter streams, the clay particles remain in suspension for long periods of time. The result is cloudy, turbid water (see Map 3-5).

Parts of Deer, Lost, Lake, and Antelope creeks within the Little Butte Creek analytical watershed are prone to soil creep and slumping. The same is true of portions of the headwaters of Emigrant Creek in the Bear Creek analytical watershed. Soil in these areas, formed from weathered tuffs and breccias, typically have high shrink-swell potential. Although slides are a natural occurrence, road construction and timber harvest may accelerate them. These clay soils stay in prolonged suspension when they enter a stream, resulting in cloudy, turbid water.

The West Fork Cow Creek and the Rogue-Wild Section analytical watersheds experience high rainfall and have a potential for landslides in areas where slopes are steep. Road construction in these areas can increase landslide occurrence.

Howard and Julie creeks within the Rogue-Wild Section analytical watershed are particularly sensitive to management activities due to the Galice Complex wildfire of 1987. Approximately 85 percent of these drainages were affected by the fire and resulting timber salvage. Although rehabilitation efforts were successful, these two drainages are subject to erosion during winter storms.

Both natural events and resource management activities may result in vegetation removal and/or soil disturbance, contributing to watershed cumulative effects. Table 3-WA-1 identifies small watersheds where cumulative effects are a concern due to the potential for water quality degradation. For a discussion of these watersheds with high cumulative effects see Appendix U. Due to the checkerboard-ownership pattern that exists in the planning area, BLM-administered lands in most watersheds often comprise 50 percent or less of the total acreage. BLM's management options can be restricted in a watershed where activity on private land has contributed to detrimental cumulative effects.

Upland rehabilitation projects, implemented during the 1980s, include scarification, waterbarring, and seeding roads; blocking and gating roads; planting trees in an abandoned mining claim area; and mulching and seeding a rock quarry site for erosion control. Fire rehabilitation work involved seeding and installing waterbars on fire trails, seeding sensitive bare soil areas, and installing sediment check dams in stream channels.

Table 3-WA-1. Areas with Cumulative Effects Concerns

Analytical Watershed	Subwatershed	Area of Concern
Big Butte Creek	Clark Creek	Clark Creek
Deer Creek	White Creek	White Creek
Elk Creek	Middle Elk Creek	Alco-Middle Flat Creek Miller-Jones
	Lower Elk Creek	Yellow Rock
Evans Creek	East Fork Evans Creek	Sprignett Creek
	Upper West Fork Evans Creek	West Fork Evans Headwaters West Skeleton Mountain Ash Flat
	Rock/Salt Creeks	Cold Creek
Grave Creek	Upper Grave Creek	Upper Grave Creek Grave-Boulders
Jenny Creek	Keene Creek	Parsnip-Keene
Jumpoff-Joe Creek	Upper Jumpoff-Joe Creek	Orofino-Joe Fall-Joe Daisy-Joe
	Louse Creek	Upper Louse Creek
Little Butte Creek	Lake Creek	Upper Lake Creek
Lost Creek	Upper Lost Creek	Vine Maple
	Lower Lost Creek	Lost-Floras
North Fork Silver Creek	North Fork Silver Creek	North Fork Silver Creek
Rogue-Wild Section	Missouri Creek	Missouri-Trout
Williams Creek	West Fork Williams Creek	Lone-Goodwin

Biological Diversity

Biological diversity refers to the variety of life and its processes. It is primarily characterized in terms of the presence, abundance, and relative dominance of species and by the structural and spatial characteristics of habitats. In this document, the biological diversity of BLM-managed ecosystems are described in terms of the following components: genetic diversity, species diversity, landscape diversity, and ecosystem diversity (including structural and functional diversity). Emphasis is placed on characteristics of the plant community and the habitat it affords. See the wildlife section for an expanded discussion of wildlife populations and the interactions between animals and habitat.

Ecological health, a closely allied concept, is defined in FEMAT as "the state of an ecosystem in which processes and functions are adequate to maintain the diversity of biotic communities commensurate with those initially found there." Ecosystem diversity, expressed as the relative abundance and dominance of biotic elements within stands and landscapes determines whether ecological processes are able to supply the resources and the habitats on which species survival depends.

The level of resiliency and stability in ecosystems has sometimes been termed "forest health". The discussion of functional diversity includes an estimate of the extent to which BLM ecosystems are stressed and are no longer stable or resilient and exhibit a diminished capacity to meet management objectives.

For most purposes, the best baseline for biological diversity analysis is the range of pre-management or historic conditions over which stand and landscape characteristics and ecological processes fluctuated. That range of natural fluctuation however, is difficult to quantify and is known to have changed over time with changes in climate.

Various attempts have been made to characterize the range of pre-management or historic conditions, including work by Teensma, Rienstra, and Yeiter (1991) and Agee (1991). The most comprehensive attempt for Pacific Northwest forests is the Forest Service "Regional Ecosystem Assessment project (REAP)" completed in June 1993 (USFS, 1993). In as far as possible, that project compared current characteristics of terrestrial and aquatic ecosystems with the estimated characteristics of those ecosystems during the period 1600 to the mid-1900s. The comparisons were broken out by river basin and vegetation series. While the data-base for estimation of pre-management conditions only includes Forest Service administered lands, REAP was used in this chapter where possible, to compare current conditions on BLM lands and across other ownerships with the probable range of historic conditions. Other information, research data, and professional estimates have been used to otherwise make this comparison. Comparisons have generally not been possible for riparian and aquatic condition because of the lack of appropriate inventory data.

During the last 100 years, human activity has dramatically changed the natural environment of the planning area. Forest land has been particularly affected by fire suppression, logging and silvicultural practices. The most striking changes have occurred within the last 30 to 50 years and include:

- a. Widespread changes in forest fragmentation. Fragmentation patterns differ within BLM stands and within the entire managed landscape because of different management approaches on different ownerships.
- b. A decrease in the acreage of old growth, mature, and late seral stands, with a corresponding increase in the acreage of early and mid-seral stands. Early and mid-seral stands resulting from logging operations generally have fewer snags and less structure than found in natural stands.
- c. Increases in stand density, fuel loading, fuel continuities, and fire hazard in stands that have not received regeneration harvests. Fire exclusion has led to the development of dense underbrush and has increased the presence, abundance and dominance of shade-tolerant climax species.
- d. Damage to the riparian vegetation and associated aquatic habitat in many watersheds.

A number of different forest management approaches have been used on BLM lands beginning in 1918. The result has been a variety of stands with differing amounts of structure and species composition. Approximately 22 percent of the suitable commercial forest land exists in young even-aged stands less than 30 years old. These stands have primarily resulted from clearcut or mortality salvage harvest after wildfires. Approximately 29 percent of the suitable commercial forest land has been subject to partial cut harvest and about 49 percent exists in other conditions. An additional 194,791 acres of nonsuitable commercial forest land has been largely unaffected by harvest (see Figure 3-BD-1).

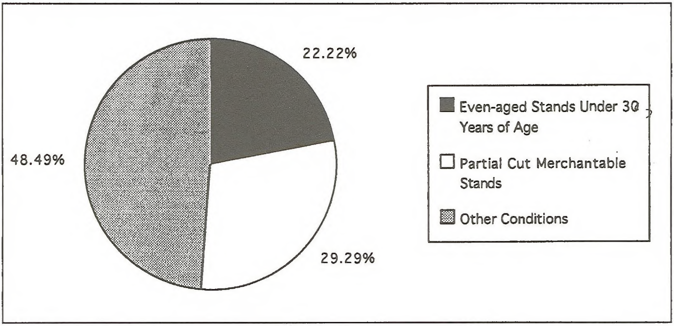


Figure 3-BD-1. *Status of Suitable Commercial Forestland*

A comparison of current forest condition with the probable range of historic condition is shown in Table 3-BD-1. Comparisons are stated in terms of whether the rate of tree mortality, stand vigor and growth, and species composition are: a) well outside, b) outside, or c) within the range of natural conditions. Trend is shown in terms of whether forest condition is estimated to be improving, static, or deteriorating.

Genetic Diversity

Genetic diversity refers to the sum of the genetic material represented by different species within an ecosystem. The level of genetic diversity may be characterized in terms of variation in genetic composition which occurs within stands, between

Table 3-BD-1. Estimated Condition Of Plant Series On The Medford District In Relation To Their Range Of Natural Variation

Plant[5] Series	Forest Characteristic Rate of Tree Mortality	Stand Growth and Vigor	Species Composition	Trend[1]
Pine	Well outside[2]	Outside[3]	Well outside	Deteriorating
Shasta red fir	Within[4]	Within	Outside	Static
White fir	Outside	Outside	Outside	Deteriorating
White oak	Well outside	Outside	Well outside	Static to improving
Tanoak	Within	Outside	Outside	Deteriorating
Western	Within	Within	Outside	Static hemlock
Douglas-fir	Well outside	Outside	Outside	Deteriorating

[1] Trend is shown in terms of whether forest condition is estimated to be improving, static, or deteriorating.
[2] Well outside the range of natural conditions.
[3] Outside the range of natural conditions.
[4] Within the range of natural conditions.
[5] Series is used in this comparison, rather than Major Plant Grouping, because the information was gleaned from inventory data, research data and other publications which could be best referenced to Series classifications. See the Vegetation section for a comparison between series and major plant groupings.

stands and within a local region. More than 1,000 invertebrate species, each with a distinct set of genetic characteristics, have been identified within a single old growth stand (Franklin 1988). The number of genes within a species can range from 1,000 in bacteria, to 10,000 in fungi, to 400,000 or more in flowering plants (Wilson 1988).

Principal changes to the genetic diversity of BLM managed ecosystems over the last 100 years are associated with: 1) the local extirpation of animal species, such as the wolf and grizzly bear, and the loss of the genetic material associated with those species; and 2) the addition of non-native genetic material in exotic plants, animals, and diseases. Principal risks to genetic diversity include habitat fragmentation, which limits or prevents genetic interchange, and habitat loss with its consequent reductions in wildlife populations or loss of species. Specific impacts of past forest management on genetic diversity are uncertain. However, all silvicultural actions affect genetic composition to some degree (Ledig and Smith 1981).

Approximately 2,380 acres on the Medford district have been planted with genetically-selected Douglas-fir to date. The project program does not appear to pose a risk to the species or to long term yield sustainability, since tree breeding programs are designed to prevent excessive narrowing of gene pools.

The genetic diversity of young stands established in recent years varies depending on the number of trees used as seed sources, the number of natural seedlings that have established themselves in the stands, and the compatibility of planted seedlings with the site. The use of seed from specific seed zones and elevations helps to maintain local genetic diversity, assure site adaptability of seedlings, and minimize genetic risk (see Appendix L).

Species Diversity

Species diversity refers to the variety of living organisms found in a distinct habitat. Organisms may include plants, birds, mammals, reptiles, insects, and less visible organisms such as soil mycorrhizal fungi. Maintaining species diversity requires maintaining viable populations of each species. When local populations of a species drop below this level, local extinction of the species becomes more probable (Schafer 1990).

Species diversity varies from place to place and has changed over time. Plant species diversity within and between natural stands depends on differences in site and potential natural vegetation and differences in the intensity, extent, and time since natural disturbance events. Species diversity of managed stands varies depending on time since harvest, potential natural vegetation, and the management regime which was applied. Table 3-BD-2 displays tree species composition in late successional forest stands by sustained yield unit (SYU). BLM's inventory was not stratified by plant community, so species composition can only be displayed by sustained yield unit or seral stage. See the frequency and constancy tables in Forest Service plant association handbooks for characterization of species diversity by Series and by association.

For forests of southwestern Oregon and northern California, wildlife species richness appears to be independent of seral-stage. However, species abundance is highly correlated with the age and condition of stands (Raphael 1991). The old growth stage has more shade-tolerant plant species such as Pacific yew, white fir, and western hemlock and tends to be the richest in insect species, lichens, fungi, and micro-flora and fauna. This variety of life is made possible by fine-grained patterns of disturbance in the old growth seral stage and by large trees which

Table 3-BD-2. Tree Species Composition of Mature and Old Growth Stands by Percent Basal Area

	Basal Area (Percent)				
SYU	**Douglas-fir**	**Ponderosa Pine**	**White Fir**	**Other Conifers**	**Hardwoods**
Jackson	71	8	12	3	7
Josephine	70	7	4	4	16
Klamath	22	15	57	5	1

support and shelter these organisms with favorable temperature and moisture regimes. Old growth stands contain the most nonliving organic material and associated organisms.

The species composition of unmanaged, natural forests was shaped by the interaction of evolutionary processes, changes in climatic which occurred over time, and ecological processes such as disturbance and succession (Polunin 1960). In southwestern Oregon, the type and frequency of disturbance plays a major role in determining the natural distribution of plants, largely because of high natural fire frequencies. Long term reduction or elimination of disturbance would change the species composition of forest stands. The current species composition of stands depicted in Table 3-BD-2 reflect, in part, the effects of protection of stands from disturbance by wild fire. Hardwoods, white fir, and more shade tolerant species currently constitute a higher percentage of stand basal area than would have occurred with continued natural levels of disturbance. In the Siskiyou Range, without frequent disturbance, conifers would over time continue to be replaced by the more tolerant tanoak hardwood species.

Species diversity varies by physiographic province. The Siskiyou Mountain Range is thought to have a higher level of plant species diversity than any other temperate forest area (Arno and Hammerly 1984). The complex ecological sites of the Siskiyou Range may have served as refugia for plant species during periods of unfavorable climates. Many species exist there as relict populations (Whitaker 1961).

Native American cultures affected the distribution of plant and animal species through hunting and the use of fire. Early settlers affected animal species diversity through trapping and hunting. Logging and grazing affected areas where pioneers had access, generally the Cascade Mountains.

The introduction of exotic plants, diseases, and insects has affected species composition in the planning area. Nonnative plants include: medusahead, cheatgrass, smooth brome, orchard grass, yellow star thistle, tansy ragwort, and Canada thistle. Port-Orford-cedar root disease affects the distribution of that species.

Landscape Diversity

Landscape diversity refers to the size, shape, and connectedness of different ecosystems and habitats on a local or regional basis. Landscape diversity may be described in terms of the arrangement of patches within a stand or in terms of the arrangement of stands (ecosystems) within a watershed or larger area. For example, a landscape interspersed with grasslands, shrublands, meadows, ponds, streams, wetlands, and forests has greater biological diversity than one with a broad expanse of grassland.

Much of the concern over landscape management focuses on the amount and location of remaining late-successional forest patches. While several preliminary ecological definitions of old growth have been developed by researchers (Old Growth Definition Task Group 1986, PNW-GTR-285), BLM has no specific mature and old growth inventory showing what stands meet a specific definition. For this document, stands are defined in terms of age-classes and by the extent to which ecological functions and processes inherent to the seral stage are retained (see Table 3-V-3).

For interim purposes and for modeling silvicultural regimes that retain older forest characteristics, BLM used data from continuous forest inventory plots which characterize old growth and mature forest types. This data included species composition, structural details, coarse woody debris, snags, and crown closure. Data from unentered old growth and mature plots in different plant communities was combined by SYU (see Tables 3-BD-4, 3-BD-6, and 3-BD-7).

Timber harvest has reduced the proportion of the forest that exists as mature and old growth stages and fragmented such stands into a series of habitat islands separated by younger or partial cut forests. The remaining natural forest on BLM-administered land is further fragmented because of the "checkerboard-ownership" pattern. Clearcuts tend to be spread across the landscape and average 10 to 40 acres in size. Partial-cut units vary from small areas to entire sections.

The size of old growth patches and the seral stage of adjacent stands have been shown to affect the quality of habitat that exists within old growth stands. All smaller patches and those portions of old growth stands close to the edge of an early seral block are subject to a variety of external factors that may reduce their effectiveness as old growth habitat. External factors include wind, temperature, and predation from species inhabiting adjacent lands. Thus, interior old growth habitat is substantially less than total old growth acres (Harris 1984).

Edge effects extend approximately 600 feet into old growth stands from adjacent clear cuts or young stands due to changes in environmental parameters such as light, temperature, and relative humidity. Old growth stands must exceed 1,200 feet across and 26 acres in size before interior old growth habitat is fully expressed (Harris 1984). However, some research indicates the effect of edge on relative humidity extends more than 700 feet into old growth stands (Chen, Franklin, and Spies 1990). Other analysts have concluded interior habitat starts about 400 feet from adjacent clearcuts; both the Wilderness Society and the USFS have used that distance in recent analyses.

Interior, late-successional forest habitat on BLM-administered land is shown in Table 3-BD-4. Interior habitat is at least 400 feet from adjacent private land or forest stands younger than 70 years. Many of the remaining blocks of old growth contain little interior habitat because of their size.

Stands that are lightly entered by partial cuts may represent interior habitat and may adequately buffer adjacent unentered stands from the effects of wind and temperature. In estimating interior habitat, those stands rated as intact or limited habitat are considered to buffer unentered stands and to provide interior habitat.

These remaining older forest blocks are distributed throughout the planning area (see Table 3-BD-4). The impact of the current level of habitat fragmentation on species number and survival is uncertain. Theory predicts old-growth-dependent species will be lost from isolated habitat islands due to genetic isolation, inbreeding, and random mortality (Harris 1984). Correlations between fragmentation and the richness and abundance of animal species in Pacific Northwest forests are weak, although the potential for effect has been shown for tropical forest (Klein 1989; Lehkugl and Ruggiero 1990).

Refer to Chapter 4 Biodiversity for additional information on current stand condition and future potential.

Ecosystem Diversity

Ecosystem diversity refers to the combinations and arrangements of species and ecological processes which occur in different physical settings, expressed as plant community types. It includes the variety and relative abundance of structural and other living and dead biotic elements within ecosystems as well as species composition. This aspect of biological diversity includes riparian communities, young stands, mature and old growth forests, upland meadows, and serpentine areas existing within the planning area. Special and unique ecosystems provide yet another component of ecosystem diversity. These areas include wetland, shrub/chaparral, and hardwood communities as well as plant communities existing on rock cliffs and talus slopes.

Ecosystem diversity may be described at a variety of scales. Canopy gaps and other structural and seral elements within individual stands may be described or entire stands and watersheds may be described.

The potential toward which ecosystems can develop are defined by descriptions of potential natural vegetation, for instance in terms of Series and Plant Associations. Classification of communities into plant associations is incomplete on BLM-administered land. For purposes of this document, ecological potential was broadly characterized into interim classifications called “major plant groupings” (see Vegetation section and Table 3-V-2). Series and association descriptions which broadly fit southwestern Oregon were published by Tesch et al., 1993. In this document Series is used when required for reference to the ecological literature.

Current vegetation may be described in terms of successional stages (seral-stages) or in terms of classes which have common structural characteristics and species composition. Current vegetation is characterized in this document in terms of seral-stages and by the degree to which ecological functions and processes of that seral stage have been retained (see vegetation section and Table 3-V-3).

The REAP report dealt with seral diversity by portraying landscape composition in two successional classes, early- and late-successional. REAP early-successional vegetation is generally equivalent to BLM stands 40 years of age less and heavily partial-cut stands. REAP late-successional vegetation is generally equivalent to BLM's classification of stands 101 years of age or older. Table 3-BD-3 compares current landscape composition of BLM forest land and the total forest landscape with the estimated range of historic conditions. REAP classifications of early-successional forests with and without snags has been combined with data about partial-cut stands to include stands with and without retained green and dead retention trees.

The most obvious differences between seral stages are differences in stand structure such as the numbers of large-trees, snags, and fallen trees.

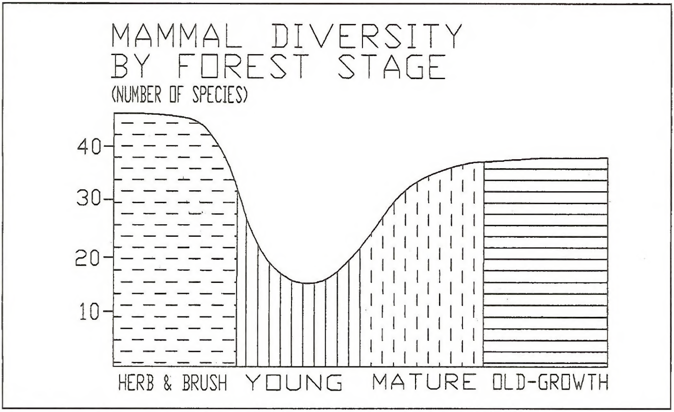


FIGURE 3-BD-2. Relation between successional stage and number of mammal species using each stage as primary habitat (data based on Harris 1964)

Structures retained from later seral stages to the early seral stage (biological legacies) help provide for the reestablishment of mature and old growth species and ecological functions after disturbance. In unmanaged forests, the level of retention varies greatly between stands. Physical structures provide habitat niches, energy sources, and physical substrates that support processes such as nutrient cycling, plant and animal reproduction, and nitrogen fixation. The assemblage of species and structures varies between seral stages and supports the processes of forest succession, incorporation of organic matter into soils, and predator-prey relationships. The current structures of late

Table 3-BD-3. Comparison of Current Condition with the Range of Historic Conditions

Analytic Period and Extent	Estimated Percent of Analytic Landscape Early Successional Condition without Snags	Early Successional Condition with Snags or Structure	Late Successional Condition
Historic Condition			
Total Forest Landscape	Negligible	10 to 40	45 to 75
Current Condition			
BLM-Administered Land	19	6	43
Current Condition			
BLM + Private[1] Forest Landscape	62	13	20

[1] Estimated based on incomplete data

successional stands in each sustained yield unit are shown in Table 3-BD-7.

The death and fall of large trees influence the structure and dynamics of forest ecosystems (Franklin, Shuygar, and Harmon 1987). Snags provide habitat for cavity users (see Wildlife). Dead and down, woody material provides habitat for many species including decomposers, an integral part of healthy forest ecosystems. Over time, as snags fall and down logs decay, within stand structure decreases unless large green trees are left on the site to replace dead components.

Structural diversity is usually lower during the mid- and late seral stages of natural stands than during other stages of successional development (Franklin and Dryness 1973; Long 1977; Franklin et al. 1981). Young stands may or may not have larger amounts of down wood, depending on the level of unmerchantable wood removal and site preparation. Table 3-BD-5 shows the quantity of down logs and snags found in younger stands. On the Medford district, younger managed stands (20 to 30 years old) have greater amounts of down logs (tons/acre) in the Jackson and Josephine SYUs than are found in natural mature and old growth forest types in those SYUs because little unmerchantable wood was removed during harvest. The practice of mechanical scarification, piling of logging residues, and burning of the piles has resulted in younger managed stands with fewer down logs (tons/acre) in the Klamath SYU. Younger managed stands in all three SYUs contain fewer large snags/acre than found in natural mature and old growth forest types (see Tables 3-BD-4 through 7). The extent to which fire suppression over the last century has affected numbers of down logs and snags on the district is uncertain.

Vertical diversity of stands can be characterized by the number and arrangement of separate canopy layers or tree height classes. Such diversity varies by seral stage, depending on the intensity of disturbance that re-set succession. Younger stands in the mid- to late seral stages, particularly those without biological legacies, often have only one canopy layer, have usually reached canopy closure, and have little understory vegetation.

The size and frequency of canopy gaps and the degree of canopy closure influence species composition, successional dynamics, nutrient cycling, and wildlife habitat. Canopy gap formation occurs as the stand ages, usually becoming pronounced in the later mature seral stage. Disturbance frequency and severity are the primary determinants of gap formation (Spies, Franklin, and Klopsch 1990).

Functional diversity refers to the variety of ways in which different ecosystems or ecosystem segments operate and change over time and the manner in which energy and nutrients are created, stored, or flow within the systems. Functions are maintained within the range of natural variation as long the species, structures and structural arrangements of ecosystem components are also within the range of natural variation at scales and with spatial and temporal extents at which the process operates.

Of all the functional mechanisms responsible for shaping forest communities, disturbance events are the most important. These events reset plant succession in patches and entire stands and prevent succession from continuing to a true climax on most sites. Disturbance events include wildfire, windthrow, insect attack, and tree disease (see Insect and Disease, Appendix S).

Table 3-BD-4. Existing Old Growth and Mature Forest

	Old Growth (Age 200+)		Old Growth and Mature Combined		Interior Old Habitat	
Block Size (Acres)	No. of Blocks	Total Acres	No. of Blocks	Total Acres	No. of Blocks	Total Acres
20-79	473	19,300	897	37,600	190	7,700
80-299	243	37,800	496	74,000	83	12,800
300-599	58	23,700	179	75,400	11	4,600
600+	14	20,200	91	131,000	1	800

Table 3-BD-5. Dead Components of Stands Age Class 20 Years and Younger

SYU	Down Logs (Tons/Acre)	Number of Snags/Acre Greater than 15 Inches in Diameter
Jackson	18.99	0.39
Josephine	14.66	1.32
Klamath	3.10	0.71

Table 3-BD-7. Dead Components for Mature and Old Growth Forest Types

SYU	Down Logs (Tons/Acre)	Number of Snags/ Acre Greater than 15 Inches in Diameter
Jackson	13.42	4.0
Josephine	12.74	3.6
Klamath	26.90	7.2

In southwestern Oregon, fire has played the predominant disturbance role. Historically, fire return intervals vary from about 10 years for the pine and Douglas-fir forests of the dry interior valleys, to 50 years in the mid-elevation and higher elevation Siskiyou Range, to hundreds of years in the Cascade Mountains. Undercanopy fires and subsequent succession in understories and small patches, have created fine-grained landscape detail within stands and shaped the multiple-specied, multiple-canopied stands originally present in the planning area. Remaining unentered old growth and mature stands display such complexity of pattern and structure.

Wildfire occurrence tends to be periodic. For the years 1980 through 1988, wildfire on BLM-administered land varied between a low of 4 acres in 1983 to a high of 37,062 acres in 1987. The average for the period was 54 fires per year totaling 4,647 acres. The 1987 fires are important in that they could represent the extreme or "worst case" scenario.

The suppression of disturbance, together with past approaches to management, has resulted in some components of southwestern Oregon ecosystems being outside the estimated range of historic variation in the rate of conifer mortality or in the type and rate of seral development.

A primary concern over forest conditions has arisen from the accelerated, widespread mortality of conifers, especially on lands within the pine series. Under natural conditions, both tree mortality rates and the causes of mortality vary between seral stages as shown in Table 3-BD-8.

Expected mortality rates for young stands and older trees of different species were discussed by Hann and Wang (1990) and are compared with observed mortality rates on FIR plots in southwestern Oregon in Appendix AA. Young stands established in the past few decades appear to have mortality rates consistent with the literature, but some exceptions exist where mortality rates are quite high.

Table 3-BD-6. Structural Characteristics for Mature and Old Growth Forest Types

SYU	Mean Stand Diameter (Inches)	Average No. TPA[1] Greater Than 30 Inch	Average Percent of Canopy Closure	Average Number of Canopy Layers
Jackson	8.5	6.2	85	2.6
Josephine	7.6	11.5	91	2.4
Klamath	13.0	10.4	84	2.1

[1] Trees per acre.

Table 3-BD-8. Natural Causes and Rates of Mortality by Seral Stage

Seral Stage	Natural Mortality Rate	Typical Mortality Causes
Early	Very high	Drought Heat Growing season frost Animal damage Interspecific competition
Mid	High	Interspecific competition Growing season frost Pathogens Animal damage
Late	High to medium	Intraspecific competition Pathogens
Mature	Medium to low	Pathogens and insects Wind Competition
Old growth	Low to medium	Wind Pathogens and insects Physiological disorders

Field evaluations of young stands with high mortality rates indicate that much of the mortality is a result of the plant species composition of these stands. Conifer species have sometimes been planted on sites that are physically not conducive to their long term survival. In addition, the sequence of management practices has sometimes resulted in higher levels of moisture competition from shrub species, such as whiteleaf manzanita, then would have occurred under natural conditions.

Relationships between the potential species composition of stands and site variables which characterize the temperature and moisture environments within which plants grow in southwestern Oregon were published by Waring, Reed, and Emmingham (1972). Soil variables, particularly soil moisture holding capacity also strongly influence the potential natural community. Since these variables can only be changed temporarily by management, they pose relatively unalterable limits on stand species composition.

The most common shrub-related mortality problems are associated with the presence of large numbers of whiteleaf manzanita and deerbrush ceanothus. These shrubs occur on dry forest types and have the ability to kill conifers through moisture competition regardless of relative canopy position (Miller and Poole, 1979).

As stands age, moisture stress problems and consequent mortality become more severe for reasons discussed by Waring (1987):

- Decreased water conductance and other physiological problems increase with tree size and age making older trees more susceptible to drought and other stressors.
- The amount of photosynthate required to meet the respiratory requirements of a tree increases with tree size, making less of the energy produced through photosynthesis available for growth or to withstand stress. The energy required to maintain the life of trees or of stands increases rapidly with air temperature and with tree size.
- As shade tolerant tree species invade the understories of stands, moisture stress within those stands increases. Unlike intolerant species, tolerant species tend to allocate more of their net photosynthate to leaves, less to roots, and have lower carbohydrate reserves that can be used to

withstand stress. As a result, tolerant trees often die of moisture stress at sizes well below the sizes at which the respiratory requirements of large intolerant trees would be met.

On hot, dry sites in southwestern Oregon, without understory disturbance, shade tolerant species regenerate in the understories of large intolerant trees. As competition for moisture intensifies, large overstory trees die because their respiratory requirements cannot be met. Then as the tolerant trees grow larger, they begin to die in drought years at sizes far smaller than the large intolerants that they replaced. The restoration of stand vigor, for specific tree species in hot, xeric environments requires thinning to lower stand densities than what is required on more mesic sites. In many instances, stand densities required need to be less than those produced by traditional commercial thinnings.

It is estimated that 100 to 200 million board feet (mmbf) of dead and dying timber volume currently exists on the district. Another 40 mmbf of salvage volume has been harvested in the last two years. More fundamental to the loss of individual or groups of trees, the forest remaining after mortality or salvage is a less vigorous, less productive forest composed of more tolerant species that will continue to show mortality, perhaps ending in the wholesale mortality of stands with patterns similar to that seen in the Blue Mountains.

Changes in the frequency, intensity and type of stand disturbance have resulted in the development of stands that are outside the range of natural variation in seral development for the site and for the habitat type. Because seral development is following a different pathway, these stands exhibit species composition, levels of mortality, and structural characteristics different from natural stands.

Because of the stressed conditions of these stands, insects and disease organisms have the potential to cause higher levels of mortality and/or lower growth rates compared to their historic ranges. Stressed characteristics are sometimes accentuated by the choice of species planted in regeneration units or the choice of species left during partial-cutting. In addition to the mortality rates discussed above the following kinds of stressed conditions are evident:

- Some young ponderosa pine plantations in the mixed conifer and mixed evergreen forest zones that are not adapted to moist mid-elevation sites, exhibit poor growth and are infected with Bynum's Blight. The importance and number of stands showing these characteristics have decreased over the last decade as reforestation with appropriate species and precommercial thinning operations have reduced the ponderosa pine component of these stands.

- Stands of the tanoak series in the Siskiyou Mountain Range and of the white fir series of the Cascade Mountains have experienced a shift toward higher densities and a higher percent composition by later seral species. These shifts are caused by a combination of fire suppression and partial-cut harvesting that did not adequately disturb understory vegetation and which released later seral species. This shift in species composition occurs throughout the tanoak and white fir series and is not localized to any one part of the district.

- Several plant communities have been invaded by non-native plants or plant diseases. The most effected include riparian zones in the Siskiyou Range (affected by the Port-Orford cedar root disease), plant communities that contained a high proportion of five needle pines (affected by white pine blister rust), and low elevation grasslands (invaded by introduced plants such as medusahead and yellow star thistle).

- Forest conditions in the Pine and Tanoak Series forests pose particular problems for the successful implementation of forest management strategies because current mortality patterns in older stands and developing fuel ladders limit the range of potentially successful management options. These conditions are most evident in the southern part of the district. Stands in the northern portions of the district are generally more vigorous, exhibit less seral change and stress and generally pose lower risks of loss from wildfire.

Vegetation

The vegetation of southwestern Oregon has evolved in one of the most ecologically diverse areas in the United States. Floristically the region combines elements of northern California and eastern Oregon floras with a large number of species indigenous only to the Klamath Mountain region (Whitaker 1960, 1961).

Vegetation is categorized by plant communities classified according to the dominant plant species. These plant communities contain animals that depend on them for food and cover. In many cases, animals are critical in pollination and seed dispersal and may be the key factor that permits plant species to migrate in response to climatic changes.

The planning area lies primarily within the mixed conifer, mixed evergreen, and interior valley vegetation zones (Franklin and Dyrness l973). The ponderosa pine, grand fir, Douglas-fir, and subalpine forest vegetation zones are also present but to a lesser extent. Small inclusions of desert shrub communities occur near Soda Mountain.

Plant Community Groupings

For purposes of this document, upland plant associations within these zones have been classified into seven major plant community groupings (see Table 3-V-2). These groupings, together with pertinent seral stages, provide the basis for describing forestland communities and wildlife habitat. Information specific to plant community groupings, together with other data, is used to determine the conifer growth response expected from vegetation management.

Plant communities groupings are classified and named according to existing dominant plant species rather than potential climax species. The use of other (rather than climax) seral stages in describing plant community groupings for the planning area is due to:

- the frequency of natural disturbance events usually prevents the attainment of a true climax;
- dry site forest communities are often subject to insect attack, resetting the stand to an earlier seral stage; and
- old growth plant communities are often not climax since neither plant composition nor stand structure stop changing after 200 years.

A plant community grouping is an aggregation of plant communities with similar management potential, the same dominant late seral conifer species, and the same principal early seral species. Plant community grouping names are based on species expected to be present after a natural disturbance is sufficiently intense to set the seral stage back to its first stage of secondary succession.

Plant community groupings were used because plant association and series classifications are incomplete on BLM-administered land and because emphasis had been placed on the management of early successional vegetation in the description and analysis of even-aged, shorter rotation silvicultural systems. For discussion of the characteristics of unmanaged forests and in making comparison between the characteristics of managed forests and characteristics of unmanaged later seral forest and for referencing to the research literature, it is more useful and correct to use series classifications. In this documents, series, as well as groupings are used depending on their usefulness and validity.

Table 3-V-1 below shows the relationships between series and groupings for the Medford District.

A discussion of the Series and Plant Associations of southwestern Oregon is found in the Oregon State

Table 3-V-1. Relationships Between Major Plant Groupings and Series

Major Plant Grouping	Series
Ponderosa pine/snowbrush-manzanita/grass	Ponderosa Pine
Shasta red fir/shrub/herbaceous	Shasta fir
Douglas-fir/ponderosa pine/Ceanothus/herbaceous	White fir[1] Western Hemlock
White oak-ponderosa pine/manzanita-wedgeleaf/grass	White oak
Douglas-fir/tanoak-madrone	Tanoak
Mixed conifer/madrone-deciduous brush/salal	Western hemlock[1] White fir Douglas-fir
Mixed conifer/interior valley/grass	Douglas-fir[1] Ponderosa pine

[1] Principal series in grouping.

University publication "Reforestation Practices in Southwestern Oregon and Northern California and is not repeated here (Atzet et al. 1992). The following major plant groupings are found in the planning area (see Figure 3-V-1):

Ponderosa pine/snowbrush-manzanita/grass grouping: There are 4,764 acres of this predominant forest grouping for lands east of or lower in elevation than the mixed conifer forests of the southern Cascade Mountains. Early seral stages usually have a strong representation of grass. Bitter cherry or other brush may occur in early seral stages if present before disturbance. Huckleberry, manzanita, bitter cherry, or bitterbrush may be present in early and mid-seral stages. Drier sites contain western juniper or oak species. Douglas-fir or white fir may be codominant with ponderosa pine in the late seral or mature forest. Frost pockets or drier sites include or are dominated by lodgepole pine. Variation in the grouping is associated with frost, fire history, logging, soil, and elevation.

Shasta red fir/shrub/herbaceous grouping: There are 973 acres of this grouping which is limited to elevations above 5,500 feet on the Dead Indian Plateau. Shrubs and herbaceous vegetation develop slowly in the early seral stage and are sparsely distributed in the understory of undisturbed stands or lightly entered partial cuts of later seral stages. These species would occupy the site if the mature or old growth stand were clearcut. Natural stands in the late seral stage are dense shasta red fir communities with chinquapin as a primary hardwood shrub. Depending on elevation, Douglas-fir, western white pine, white fir, and mountain hemlock are present. Shasta red fir may succeed itself in natural stands following disturbance events such as windthrow or fire. Fire occurrence is infrequent. Disturbance appears to be necessary for regeneration to occur.

Douglas-fir-ponderosa pine/ceanothus/ herbaceous grouping: There are 102,769 acres of this predominant plant community grouping for the Cascade Mountains. Grass, forbs, and shrub species such as snowbrush, varnishleaf, deerbrush, manzanita, and vine maple are common early seral species. Meadows or ponderosa pine stands may occupy flatter slopes due to local frost severity or soil and drainage variations (see Map 3-6). Inclusions of white oak-ponderosa pine/manzanita/grass communities represent local soil variations.

Frost-prone areas within this grouping follow a successional pattern in which ponderosa pine provides frost protection for the subsequent development of Douglas-fir or white fir in the late seral stage. Introduced annual or perennial grasses often are present. Severe grass competition in the early life of a stand may reduce conifer seedling survival, thereby prolonging the early or mid-seral stages.

Local variation has been documented within this grouping. Plant communities that are almost completely white fir occur along the western edge of the Dead Indian Plateau and appear to be invading downslope into areas of meadow and snow glades. Away from this band, white fir is common in stand understories and is clearly climax. Locally, the species may be a codominant or form nearly pure stands.

White oak-ponderosa pine/manzanita-wedgeleaf/ grass grouping: There are 142,366 acres of this plant grouping of the lower slopes and valley bottoms of the Rogue River, Cow Creek, and Klamath River drainages. Similar communities occur at higher elevations on hot, dry, fire-prone slopes of the Dead Indian Plateau and south of Soda Mountain.

Inclusions of mixed conifer forests are scattered throughout this grouping. These communities were originally pine-oak savannahs with either manzanita or wedgeleaf brush or perennial grass species dominant, depending on fire frequency. Madrone is locally present.

Klamath River drainage communities that fall within this group contain Great Basin plant species. Plant communities of the Rogue River drainage communities commonly contain species of the California annual grasslands and the Oregon white oak series. These plant groupings often show the effects of grazing and fire prior to 1934. This includes white oak sprouts, manzanita brushfields, or introduced annual grasses.

Douglas-fir/tanoak-madrone grouping: There are 264,768 acres of this plant community grouping in the Siskiyou Range in the western half of the planning area. This grouping is characterized by evergreen, tree-form hardwoods, and shrubs that resprout after disturbance, persist in the stand, and constitute a major part of the climax association. In the early seral stage, grass and forbs are sparse. The plant community is dominated by resprouting tanoak, madrone, or other evergreen hardwoods. Tanoak competition increases toward the coast with both tree-form and brush-form varieties present. Varnishleaf is locally dominant on wetter sites and canyon live oak on dry sites. Conifer species of the late seral stage include Douglas-fir, true fir, ponderosa pine, sugar pine, incense cedar, and western red cedar. Port-orford-cedar is found along coastal stream bottoms or on wetter sites. Tree-form tanoak may be the climax species and would dominate the mature and old growth stages if fire were excluded.

Also included in this plant grouping are areas that show strong serpentine influence in both species and stand density.

Mixed conifer/madrone-deciduous brush/salal grouping: There are 34,246 areas of this grouping occurring primarily in the Cow Creek drainage and in the northern part of the Cascade Mountains. Early seral vegetation consists of grasses and forbs, however, vegetation may be sparse for periods of more than a year following fire. Varnishleaf ceanothus is locally plentiful in the early seral stage and may dominate a site within two to three years after fire occurrence. Besides varnishleaf, shrub species of the mid-seral stage include ocean spray, poison oak, and deerbrush. Salal occupies cooler or unburned sites. In the late seral stage, the conifer overstory consists of Douglas-fir. Incense cedar and ponderosa pine are prevalent in some areas. Ponderosa pine usually occurs on heavy soils that are poorly drained. Madrone and other hardwoods exist in the stands but are less significant than in the Douglas-fir/tanoak-madrone grouping. Golden chinquapin occurs as both the shrub and tree-form varieties along with canyon live oak on drier sites.

Mixed conifer/interior valley/grass grouping: There are 306,242 acres of these communities of the dry interior ridges of the Siskiyou Range and lower slopes of the Cascade Mountains. Grass, herbaceous vegetation, poison oak, and deerbrush provide severe competition for conifers during the early seral stage. Deciduous shrubs compete with conifers in mid-seral stages and may delay establishment of conifer stands, particularly on hot aspects. Conifer species of late and mature seral stages are Douglas-fir and ponderosa pine, with Douglas-fir being climax. Douglas-fir succeeds itself in canopy gaps. Tree-form hardwoods are present. Hardwoods form a smaller portion of the plant community than in the tanoak-madrone grouping. Manzanita is locally present and may form dense stands.

This plant grouping has only limited areas that can be considered old growth forest. A high fire return frequency, coupled with the mortality patterns common to low elevation dry sites, acts to keep this plant grouping in younger age classes.

Seral Stages

Five seral stages have been described that apply for each major plant grouping: early seral, mid-seral, late seral, mature, and old growth/potential natural community (PNC). PNC represents the vegetation community that would become established if all successional sequences were completed without interference by man under present environmental conditions. Old growth forests usually represent the PNC for forested sites.

The speed of seral change varies. For analytic purposes, change is similar enough for all forest seral stages to have common durations.

Dominant seral vegetation for each grouping is shown in Table 3-V-2. Successional stages are displayed in Figure 3-V-2. Acres of major plant groupings and seral stages are shown in Table 3-V-3 and Figure 3-V-3, respectively, and on Map 3-6.

Early Seral Stage

Early seral stage is the time from disturbance to the time when crowns close and conifers or hardwoods dominate the site. Under the current forest management regime, the duration is approximately 0 to 10 years. This stage may be dominated by grasses and forbs or by sprouting shrubs or hardwoods. Conifers develop slowly at first and gradually replace grasses, forbs, or shrubs as the dominant vegetation. Forage may be present; hiding or thermal cover may not be present except in rapidly sprouting shrub communities.

Mid-Seral Stage

The mid-seral stage occurs from crown closure to the time when conifers would begin to die from competition, approximately age 11 to 40 years. Stands are dense and dominated by conifers, hardwoods, or thick brush. Grass, forbs, and herbaceous vegetation decrease with increasing age. Hiding cover for big game is usually present.

Late Seral Stage

Late seral stage occurs when conifers would begin to die from competition to the time when stand growth slows, approximately age 41 to 100 years. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent. Stand diversity is minimal; conifer mortality rates and snag

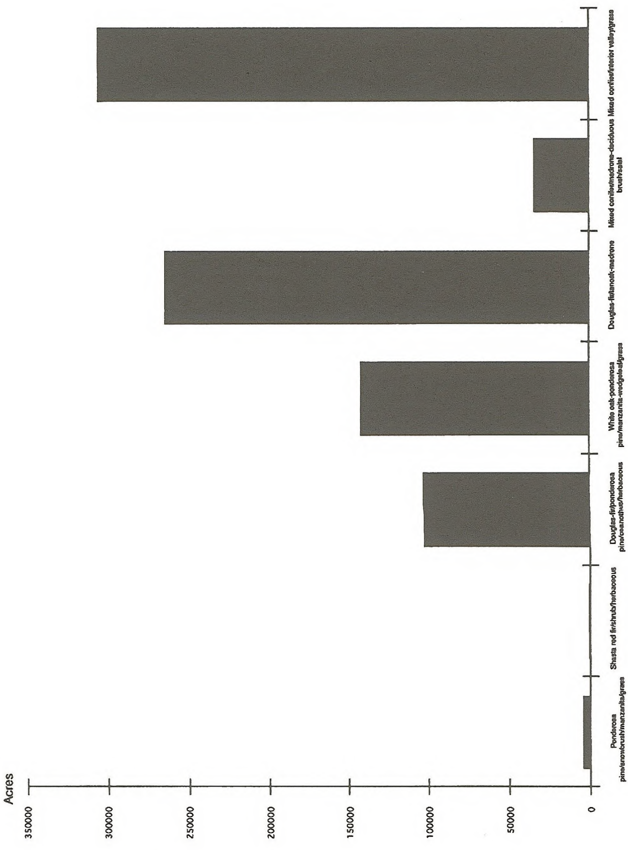


FIGURE 3-V-1. Plant Community Groupings

Table 3-V-2. Dominant Vegetation by Major Plant Grouping

Plant Grouping	Early Seral (0-10 yrs)	Mid-Seral (11-40 yrs)	Late Seral (41-100 yrs)	Mature (101-200 yrs)	Old Growth (201+ yrs)
Ponderosa pine/ snowbrush-manzanita/grass	Grass herb	Conifer, shrub	Conifer	Conifer	Conifer
Shasta red fir/ shrub/herbaceous	Grass,	Conifer,	Conifer	Conifer	Conifer
Douglas-fir ponderosa pine/ ceanothus/herbaceous	Herb, shrub	Conifer, shrub	Conifer	Conifer	Conifer
White oak- ponderosa pine/ manzanita-wedgeleaf/grass	Grass, shrub	Grass, shrub	Shrub, hardwood, conifer	Shrub, hardwood, conifer	Shrub, hardwood, conifer
Douglas-fir/ tanoak-madrone	Shrub, hardwood	Conifer, hardwood	Conifer, hardwood	Conifer, hardwood	Conifer, hardwood
Mixed conifer/ madrone-deciduous brush/salal	Herb,	Conifer,	Conifer	Conifer	Conifer
Mixed conifer /interior valley/grass	Grass, shrub	Conifer, shrub	Conifer	Conifer	Conifer

formation are rapid. Big game hiding and thermal cover is present. Forage and understory vegetation is minimal except in understocked stands or in meadow inclusions.

Mature Seral Stage

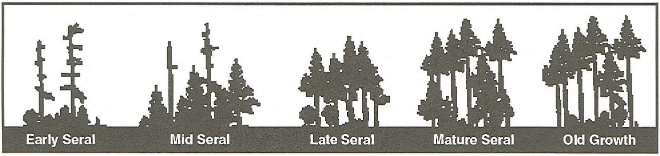
This stage exists from the point where stand growth slows to the time when the forest develops structural diversity, approximately age 101 to 200 years. Conifer and hardwood growth gradually decline as stand age increases. Developmental change slows. Larger trees increase significantly in size. Stand diversity gradually increases. Big game hiding cover, thermal cover, and some forage are present. With slowing growth, insect damage increases and stand breakup may begin on drier sites. Understory development is significant in response to openings in the canopy created by disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed.

Old growth/Potential Natural Community

This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until the time when stand replacement occurs and secondary succession begins again. Depending on past fire frequency and intensity, old growth forests may have different structures, species compositions, and age distributions. In forests with longer periods between natural disturbance, the forest structure will be more even-aged at late mature or early old growth stages.

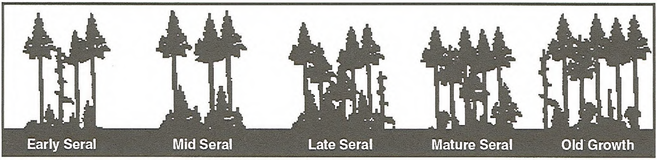
As mortality occurs, stands develop greater structural complexity. Replacement of individual trees lost to fire or windthrow results in the creation of a multi-layered canopy. There may be a shift toward more shade tolerant species. Forests with frequent fire frequencies may have multiple canopy levels develop at younger ages and may not experience a shift toward more tolerant species.

Natural, Catastrophic Stand Replacement


Early Seral
Mid Seral
Late Seral
Mature Seral
Old Growth

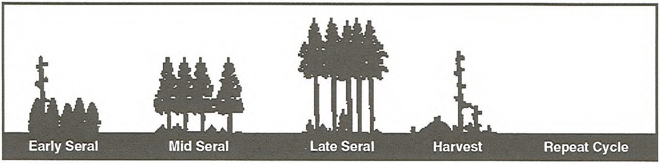
The first seral stage consists of dead trees, down trees, forbs, brush, and conifer seedlings (and very few living trees which serve as a seed source). Succession progresses in a more or less even-aged sequence, with vertical and fine grained diversity developing in the mature seral state and being fully expressed in the old growth stage.

Natural, Partial Stand Replacement


Early Seral
Mid Seral
Late Seral
Mature Seral
Old Growth

This succession path is very common in southwestern Oregon. The first seral stage consists of a patchwork of surviving green overstory trees, dead trees, and down trees. Patches contain young conifers, forbs, and hardwoods. Development is uneven-aged and patchy with vegetation developing in the understory and in patch openings, while overstory trees slowly die, turn into snags and fall.

Even-age Managed Forest


Early Seral
Mid Seral
Late Seral
Harvest
Repeat Cycle

This successional path begins after nearly complete removal of conifer volume in logging, leaving a few snags and a small amount of down wood. Development is even-aged and is truncated by harvest in short rotations.

Figure 3-V-2. Successional Stages

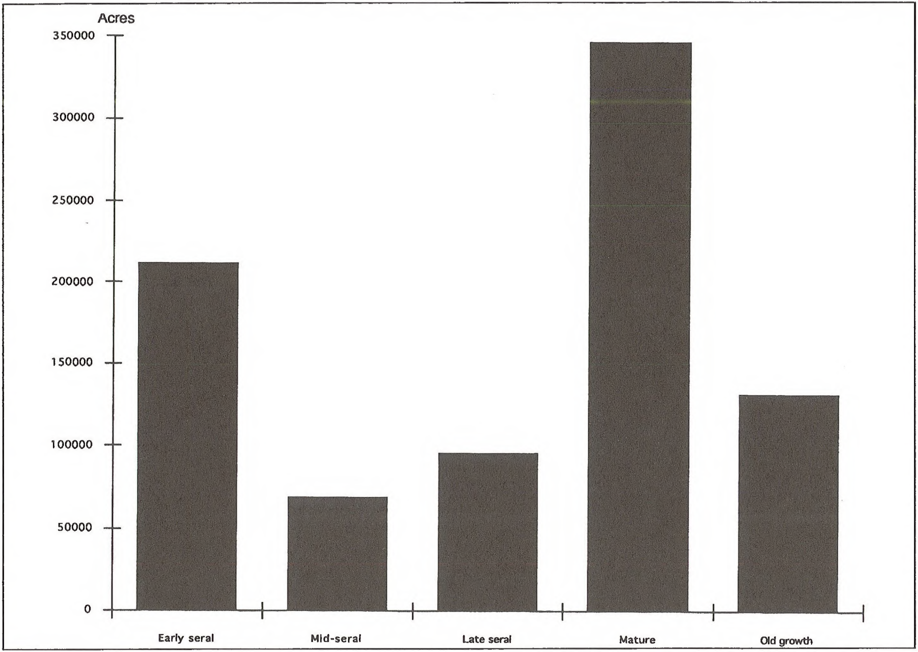


Figure 3-V-3. Seral Stages Distribution

Table 3-V-3. Major Plant Groupings by Seral Stage

Plant Grouping	Early Seral (0-10 yrs)	Mid-Seral (11-40 yrs)	Late Seral (41-100 yrs)	Mature (101-200 yrs)	Old Growth (201+ yrs)	Total
Ponderosa pine/snowbrush-manzanita/grass	881	0	932	765	2,186	4,764
Shasta red fir/shrub/herbaceous	63	0	284	494	132	973
Douglas-fir ponderosa pine/ceanothus/herbaceous	19,820	6,592	14,608	28,524	33,225	102,769
White oak-ponderosa pine/manzanita-wedgeleaf/grass	63,526	4,257	15,576	48,830	10,177	142,366
Douglas-fir/tanoak-madrone	47,733	28,289	24,509	112,841	51,396	264,768
Mixed conifer/madrone-deciduous brush/salal	6,949	6,357	5,777	8,930	6,233	34,246
Mixed conifer/interior valley/grass	73,387	23,554	33,995	146,650	28,666	306,242
Total	**212,359**	**69,049**	**95,681**	**347,024**	**132,015**	**856,128**

For old growth forests, volume may or may not decline with age (Debell and Franklin 1987). Changes in stand structure and species composition continue to occur as stands age.

For purpose of interpretation of existing forest inventory, BLM has defined old growth as forestland which is at least 10 percent stocked with trees 200 years or older in stands which are 10 acres or larger in size. While there is a correlation between habitat characteristics and age, the condition of older forests is variable. Douglas-fir forests may develop old growth characteristics between 150 and 250 years of age without management intervention (Spies and Franklin 1988). The forests of southwestern Oregon are uneven-aged and clear definition of habitat characteristics cannot be made based on age alone.

While there are some naturally occurring open stands, many of the open stands in the planning area have resulted from the partial cutting of mature and old growth stands. Because of this history of partial cutting, BLM classified its older forests according to four ecologically different types (see Table 3-V-4).

Intact older forest. Stands more than 100 years of age that have not been entered by logging or that have been lightly entered such that the structural and functional features of the forest are essentially unchanged, except in relation to habitat island size. These stands provide a full component of habitat characteristics for later seral stage dependent and associated species, including the presence of nest groves for northern spotted owls.

Table 3-V-4. Classification of Mature and Old Growth Forest Stands

Class	Acres by Class		
	Mature (100-190)	Old Growth (200+)	Total
Intact	79,983	61,946	141,929
Limited	136,083	39,911	175,994
Modified	65,377	15,259	80,636
Open	55,947	11,822	67,769

Limited older forest. Stands more than 100 years of age that retain most, but not all, characteristics of mature and old growth forests. These stands lack the full range of structural and functional features of mature and old growth because of past logging or natural disturbance. They provide foraging and perching habitat for northern spotted owls but lack nest groves.

Modified older forest. Stands more than 100 years of age that have structural and functional features which have been significantly changed by logging or natural disturbance such that the forest no longer functions as old growth. They have 40 percent or greater canopy closure of trees greater than 11 inches in diameter. The habitats provided by these forests resemble those of the early seral stage except they provide a higher level of connectivity for old growth dependent species.

Open older forest. Stands more than 100 years of age and have less than 40 percent crown closure of trees greater than 11 inches in diameter. Or, they are not representative of the principal conifer series. Residual stands with few large trees or the serpentine areas of the Siskiyou Range are examples of these kinds of stands.

Unique Vegetation Communities

Smaller vegetation communities occur within the defined major upland plant groupings. These communities are associated with wetland (see Appendix 3-VEG-1, Draft RMP) or riparian areas, serpentine soils, grassy balds, wet or dry meadows, rock cliffs, or talus slopes. Individual plant species of these communities are adapted to the unique environmental or physical conditions present and are considered unique ecosystems. Most of the 59 special status plant species found in the planning area are found in these unique ecosystems.

The upland forest communities of shrub chaparral and hardwood communities are sometimes seral and sometimes climax (see Table 3-V-5) (Franklin and Dyrness 1973; Gratkowski 1961). These special vegetative types were part of the original diverse landscape pattern and may be significant providers of wildlife habitat.

Species of Concern

Port-Orford-cedar

Two tree species found in the planning area are of special concern due to their value and concerns about their long-term survival and management.

Port-orford-cedar, *Chamaecyparia lawsoniana*, is a species common only west of the Coast and Siskiyou Ranges in southwestern Oregon and northwestern California, although it ranges further inland near the Oregon-California border. A few small populations exist almost as far inland as Mt. Shasta. The Port-orford-cedar is of interest for two reasons, its wood is of higher value than that of any other conifer species ($450 to $1,000 per thousand board feet) and it is unusually adaptable to a wide variety of sites. The species is fire resistent and is more shade tolerant than most conifers. It has the ability to grow well under forest canopies and is vigorous as a pioneer in open areas. The tree survives on sites as different as coastal sand dunes, swampy sites, dry and rocky ridges, and serpentine soils.

Port-orford-cedar is attacked by the non-native fungus, *Phytophthora lateralis*, first discovered within the cedar's natural range in 1952. The disease now affects the species over much of its range and has decimated many stands in areas where the species shows its best growth potential. Scientists doubt the disease threatens the survival of the species, because Port-orford-cedar regenerates quite aggressively. However, the fungus is expected to make the species rare in mature and old growth forests.

Table 3-V-5. Hardwood and Shrub Communities[1]

	Acres	
SYU	Hardwood	Shrub/Chaparral
Jackson	5,773	1,462
Josephine	38,973	8,608
Klamath	3,082	228

[1] Plant community: association of plants of various species found growing together in different areas with similar site characteristics (FEMAT).

Once established in a drainage, the root disease spreads rapidly but cannot move from drainage to drainage on its own. While disease can be spread by mud on the feet of animals or humans, the main agent spreading disease appears to be mud on the wheels of road-building and logging equipment or through use of diseased planting stock. Once established in a stand, the disease kills most larger trees and replacement trees before they reach merchantable sizes. Neither resistance to the disease nor an effective treatment has been identified, although research continues. The disease's infectiousness limits control through stand management practices. Past forest management practices tended to result in spreading the disease. Preventive measures such as installing washing stations and altered road design standards are felt to be effective.

Port-orford-cedar exists on approximately 5,300 acres in the western part of the planning area in the Glendale and Grant Pass resource areas. Most areas containing the species have been infected with the root disease. The Pipe Fork old growth stand is a tract of approximately 518 acres which may mark the easternmost extension of the Port-Orford plant series on BLM-administered land in Oregon. The stand appears to be uninfected with the disease and is a proposed research natural area (RNA).

The BLM and Forest Service have agreed on measures that appear to offer the best chance of limiting the spread of the disease within managed forests.

Pacific Yew

Pacific yew, *Taxus brevifolia*, ranges from southeastern Alaska along the Pacific Coast to northern California and eastward to the Rocky Mountains. It usually exists as a shrub or small tree on moist sites in stream bottoms, on upland flats, benches, and gentle slopes. It ordinarily occurs as an understory tree in older forest types, although it can survive logging disturbance and become part of younger, even-aged stands. Yew resprouts after moderate disturbance but can be killed by intense fire. The seeds are largely bird-disseminated and it tends to reproduce where bird roosting spots exist and in decaying forest litter or in old, decayed wood. Yew is not usually found as a seedling in young stands. It is the most shade tolerant of coniferous trees and grows slowly with maturity attained in about 250 to 300 years.

Pacific yew is of interest because of the drug, taxol, which shows some promise in treating ovarian cancer. Yew bark, for taxol production has been collected from existing timber sales on BLM-administered land. The species has also been harvested for posts and has a value as big game browse.

In the planning area, the species is found in riparian zones and, to a lesser extent, on upland sites. Its abundance is more variable from site to site than most species. Inventories have been completed to estimate the amount of yew present in the planning area and to identify management strategies. Estimates indicate there are approximately 1.4 million yew plants in the planning area of which 90 percent are less than 8 inches in diameter. The inventory consisted of 240 plots scattered across the planning area.

Riparian Zones

Riparian zones are the vegetated areas immediately adjacent to rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs, and wet meadows (see Figure 2-1). The vegetation and microclimate conditions in riparian zones are products of the combined presence and influence of perennial or intermittent water, associated high water tables, and soils which exhibit some wetness characteristics.

Riparian zones in the planning area occur throughout drainage systems, from the smallest intermittent headwater streams to the largest rivers such as the Rogue, Illinois, and Applegate. Riparian zones are not limited to an arbitrary, uniform distance from a water body but vary in width and shape. The size and extent of riparian zones depend on topography, soils, rainfall, water quality and quantity, stream conditions, and width of floodplains.

Riparian zones provide streambank stability, physical filtering of water, water storage, aquifer recharge, and insulate streams from summer and winter extremes. Also, they are the source of coarse woody debris which dissipates flood energy and creates aquatic habitat.

Standing riparian vegetation helps regulate water temperature through shading. It provides nesting, roosting, cover habitat, and food sources for a variety of terrestrial and aquatic animals (Brown 1985). Mature riparian vegetation has the structural components to maintain water quality, lessen peak flood flows, control erosion, and increase ground water recharge. Mature, downed trees in a floodplain provide terrestrial animal cover and food, dissipate water energy, trap sediment, increase water storage, change flow patterns, and maintain and improve aquatic habitat conditions.

Riparian Habitat Location and Condition Class

Riparian habitat on BLM-administered land in the planning area is found along 3,910 miles of second through ninth order streams. Riparian acres along streams comprise 8 percent of BLM-administered land or 69,355 acres. Riparian habitat also includes another 1,098 acres bordering ponds, lakes, and reservoirs.

Condition class for riparian acres is based on tree diameter and the results of timber harvest, roads, mining, and grazing. Approximately 18 percent of riparian areas are in minimal condition, 30 percent are in fair condition, and 52 percent are in good or optimal condition (see Table 3-RZ-1).

The greatest structural diversity in riparian areas is in old growth forests (Campbell and Franklin 1979; Franklin et al. 1981). BLM biologists evaluated the condition of riparian zones in all seral stages. The method used average tree size derived from the timber inventory database as the indicator of riparian habitat condition.

In western Oregon, riparian habitat with mature trees greater than 21 inches in diameter provides the greatest plant and structural diversity, a high level of animal diversity, and a high level of woody debris (Brown 1985). Mature riparian zones contribute to a high level of aquatic diversity and provide primary habitat for several wildlife species.

For the 6 percent of the planning area dominated by hardwoods and brush, the riparian habitat condition class may be underestimated because the rating system assumes a conifer forest and utilizes tree diameter as a primary indicator of riparian condition. Diameters of hardwoods such as tan oak, canyon live oak, and madrone are typically smaller than conifers of the same age. The ecologic potential for streamside vegetation dominated by these species occurs at a smaller diameter than if conifers were the dominant overstory vegetation.

Field inventory information from riparian zones is limited. Tree diameters were obtained by analyzing data from the timber inventory units bordering stream channels. This resulted in possible underestimation of riparian condition class because mean tree diameter is based on both upland and riparian vegetation. Therefore, riparian habitat condition is likely to be in better condition than shown by the rating system.

About 52 percent of riparian zone acres are in good/optimal condition. Generally, riparian habitat along stream orders 6 to 9 have a higher percentage of

Table 3-RZ-1. Existing Riparian Zone Condition on BLM-Administered Land

	Condition Class[1] (Acres)			
Stream Order	**Minimal**	**Fair**	**Good/Optimal**	**Total**
2	5,067	9,285	13,790	28,142
3	3,489	6,396	9,498	19,383
4	2,072	3,004	5,284	10,360
5	1,077	1,556	3,351	5,984
6	280	624	1,278	2,182
7	154	221	783	1,158
8	206	50	67	323
9	0	50	1,772	1,823
Total	**12,345**	**21,187**	**35,823**	**69,355**

[1] Minimal: 0 to 11 inch diameter of trees in riparian zone.
Fair: 11 to 21 inch diameter of trees in riparian zone.
Good/Optimal: 21 inch or larger diameter of trees in riparian zone.

acres in good/optimal condition than along smaller streams.

A stream/riparian inventory conducted by BLM for the Grazing EIS during the summers of 1980 through 1982 found about 5 of 108 miles of fishery streams in scattered segments adversely affected by livestock or other ungulates such as Roosevelt elk (USDI, BLM, MDO 1984a).

All 108 miles of inventoried streams within grazing allotments are in fair or good condition. Photo points to monitor changes in riparian condition are established on 20 tributaries of major streams within grazing allotments. Riparian habitat condition surveys have not been completed on the remaining 421 miles of fishery streams in the planning area.

Riparian Zones Related to Stream Order

The structure and size of undisturbed riparian zones change as stream size increases. Generally, the width of riparian zones increases in a downstream direction and the influence of the riparian zone on the stream diminishes in a downstream direction. In first and second order streams, the stream channel is continuously shaded by vegetation due to narrow channel width. Woody debris and streamside vegetation play an important role as energy dissipators on these steep-gradient headwater streams. Coniferous debris is particularly important in the aquatic system because it typically is larger, more stable, and takes longer to decompose than deciduous species. Leaves, needles, wood, and insects from the adjacent forest provide the bulk of the food base for the aquatic communities downstream (Sedell et al. 1988).

The vegetative canopy above third and fourth order streams varies in density. These streams have wider channels with less canopy shading the stream. Stream gradients are generally less than 10 percent although there may be short distances with rapids or falls. Large woody debris is important for fish habitat and as an energy dissipator, although high flows may move this material downstream. Forest litter along third and fourth order streams is an important source of biomass for the aquatic system (Sedell et al. 1988).

The direct influence of riparian areas is moderated in fifth order and larger streams but remains important. Streamside vegetation provides some shade and keeps the main channel confined. Stream gradient is usually less than 5 percent. Large woody debris provides important fish habitat. Food resources for aquatic organisms are from algae and organic matter from upstream reaches (Sedell et al. 1988).

Post-harvest monitoring during the 1980s provided general observations of riparian zone existing condition. Riparian vegetation adjacent to undisturbed first and second order streams generally consists of forbs, understory shrubs, and conifers. Timber harvest along many of these small headwater streams has removed the conifer component which drastically reduces the future source of woody debris for stream channels. Prescribed fire eliminated much of the forb and understory shrub component for the short-term and long-term woody debris along these channels.

Riparian vegetation adjacent to undisturbed third and fourth order streams consists of forbs, shrubs, hardwoods, and conifers. In the early 1980s, protection during timber harvest included leaving hardwoods and shrubs along nonfishery streams or no-cut buffers on streams that supported fish populations. Monitoring indicated water quality objectives were not always met when only hardwoods and shrubs were retained. Based upon this monitoring, some large conifers were left to meet water quality objectives and to ensure future sources of large coniferous woody debris. Leaving substantial riparian vegetation reduced the potential for prescribed fire to enter the riparian zone.

Riparian vegetation along fifth order and larger streams is similar to that along third and fourth order streams, except the hardwoods are a dominant component and they grow larger along the larger streams. Fifth order and larger streams generally support fish and have been protected with no-cut buffers. Monitoring of fish-bearing streams during the 1980s showed riparian management areas were retained (USDI, BLM, MDO 1979b and 1980). However, approximately 25 percent did not meet standards for average horizontal width. Substandard buffers were an average of 30 feet less than the usually required width of 100 feet. Direct physical damage to riparian and stream habitat from adjacent harvest units was minimal or absent. However, it is probable that changes in microclimate, loss of future sources of large wood for stream channels, and shifts in diversity and biomass of riparian wildlife species occurred.

Riparian Zones and Habitat Diversity

Riparian zones in a watershed are key components of biological diversity, displaying a greater variety of plant and wildlife species and vegetative structure than adjoining ecosystems. Many wildlife species depend on food, water, shade and cover, and other unique and diverse habitat niches offered by riparian zones. Larger, more mobile wildlife species use riparian habitat as travel corridors to and from summer and winter ranges and as habitat connectors between feeding, resting, hiding, breeding, brooding, and rearing habitats. Approximately 70 percent of the wildlife species found in the planning area use riparian zones for some portion of their life history; 10 percent of these are found exclusively in riparian zones (Brown 1985).

Forested riparian zones in the planning area are generally more complex than adjoining plant communities because of the larger trees, diverse tree species mix, more large woody debris, and more structural and vertical diversity. Vegetation in riparian zones usually includes plants submerged in water (skunk cabbage, sedges, willow) and species which occur on drier sites (alder, willow, vine maple, bigleaf maple, Douglas-fir). Annual and perennial plants and shrubs are more diverse in riparian zones than in pristine upland plant communities.

Riparian vegetation is critically important for fish, providing undercut streambanks for escape cover, lowering summer water temperatures through shading, and reducing streambank erosion that can cause sedimentation in spawning and rearing areas. In addition, riparian vegetation contributes terrestrial insects, leaves, limbs, and trunks that drive the aquatic food chain and provide habitat for organisms.

Wildlife

About 346 vertebrate wildlife species occur in the planning area. This includes 86 mammals, 220 birds, 19 reptiles, and 21 amphibians (see Appendix 3-WL-1, Draft RMP). This document focuses on game animals and other species of high public interest (see Table 3-WL-1). Special status species, which include federal threatened and endangered, federal proposed, federal candidate, state threatened and endangered, BLM-sensitive, and BLM assessment species are addressed in Special Status Species.

Each species requires a specific set of habitat conditions. These conditions may be found within one or more plant communities and seral stages which occur in the planning area. For example, osprey are found primarily in riparian and snag habitats, whereas black bears are found in six habitat types. Habitat relationships for these and other wildlife species in western Oregon have been described by Brown (1985).

Seral stage diversity generally is correlated with wildlife diversity; the greater the number of different seral stages and associated edges present within an area, the greater the number of wildlife species present (Brown 1985). Seral stages are always changing. Natural or human-related disturbances such as fire and logging can set succession back to an earlier stage. As a result, wildlife species requiring older seral stages are replaced by those species adapted to younger ones. Thus, older forests provide preferred habitat conditions for species such as the northern spotted owl, red tree vole, and goshawk, while open, early seral stage habitat is preferred by species like the western bluebird, brush rabbit, and western fence lizard.

Harvesting mature and old growth forests has resulted in less older forest habitat and a lower wildlife diversity (Harris 1984). Mature and old growth seral stages (combined) represent 48 percent of BLM-administered forestland within the planning area. Priority species which use these older seral stages as primary habitat are listed in Table 3-WL-1.

The reduction of mature and old growth forest stages represents the most serious problem for wildlife in the planning area. Under current BLM management, older forest habitat has been harvested at the rate of 9,000 acres per year. On private lands, most older forest has been eliminated. There is not enough late seral forestland within the planning area to replace mature and old growth scheduled for harvest. In addition, the effect of fragmenting older forests may greatly reduce the value of the remaining stands (Harris 1984).

The harvest of older forests has deprived some priority species of important habitat components. For example, optimum thermal cover for Roosevelt elk has declined. Nesting areas for northern goshawks, pileated woodpeckers, band-tailed pigeons, and great blue herons have likewise declined. In addition, foraging areas for pine martens and roost areas for some bat species have declined. Snags and down logs have been removed from thousands of acres, affecting necessary habitat components for woodpeckers, other cavity users, and a variety of

Table 3-WL-1. Priority Animal Species

Species	Reason for Listing[1]	Primary Habitat[2]	Population Level/Trend[3]
Olympic salamander	HI	f	Unknown
Pacific giant salamander	HI	f	Unknown
Great blue heron	HI	d,f	Low/stable
Osprey	HI	f,h	Moderate/stable
Sharp-shinned hawk	HI	b,c,d	Unknown
Cooper's hawk	HI	b,c,d	Unknown
Red-tailed hawk	HI	a,b,c,d,e,f	Moderate/stable
Golden eagle	HI	d,e	Unknown
American kestrel	HI	a,h,i	Unknown
Band-tailed pigeon	G	i,a,b	Low/decreasing
Western screech owl	HI	h,i,c,d,e	Low/stable
Great horned owl	HI	d,c,a,i	Moderate/increasing
Great gray owl	HI	a,d	Unknown
Northern pygmy owl	HI	h,e,d,c,i	Moderate/stable
Northern saw whet owl	HI	d,c,e	Unknown
Pileated woodpecker	HI	d,e,f	Unknown
Acorn woodpecker	HI	h,d,i,c	Unknown
Red-breasted sapsucker	HI	d,h,e,i	Unknown
Williamson's sapsucker	HI	h,d,e	Unknown
Downy woodpecker	HI	h,d,e,c	Unknown
Hairy woodpecker	HI	h,d,e,c	Unknown
Northern flicker	HI	h,d,e,c,b,a	Unknown
Black bear	G	a,b,c,d,e,f	Moderate/stable
Mountain lion	G	a,b,d,g	Low/stable
Roosevelt elk	G	a,b,c,d,e,f	Moderate/stable
Black-tailed deer	G	a,b,c,d,f	High/stable
Neotropical migratory birds	HI	all	Med/decreasing

[1] HI: High public interest and concern; may be sensitive to timber harvest.
G: Game

[2] Primary habitat includes breeding, feeding, or resting sites within the following seral stages and special habitats (Brown 1985):

a: early seral	f: riparian
b: mid-seral	g: talus slope/cliff
c: late seral	h: snags
d: mature	i: hardwoods
e: old growth	

[3] Based on field observations and consultations with other agencies.

amphibians. Removal of forest canopy and other habitat components may have adverse effects on several species of neotropical migratory birds.

Early, mid, and late seral stage forests comprise approximately 44 percent of the BLM-administered land within the planning area. Wildlife problems associated with these habitats are related more to quality (such as stand characteristics, landscape patterns, extent of road construction) than to quantity of habitat. For example, inadequate interspersion of cover and forage and excessive road construction have adversely affected big game populations (Brown 1985). Another example is precommercial and commercial thinning of young stands which reduces dense nesting habitat required by accipiters (Reynolds 1983). A long-term habitat problem associated with early to late seral stages is reduced complexity in habitat structure associated with application of intensive forest management practices (e.g., short harvest rotation, thinning, and slash burning) which tend to reduce vertical and horizontal structure within forest stands.

In addition to the seral stages described above, other habitat and habitat components within the planning area have been affected by forest management. This includes snags, dead and down wood, riparian zones, and special habitats such as dry meadows, cliffs and talus slopes, wetlands, and hardwood stands.

Snags are of special concern because they provide primary habitat for 58 species of birds and mammals in the planning area (see Appendix 3-WL-1, Draft RMP). This includes dominant woodpeckers, American kestrel, western screech owl, northern pygmy owl, and flying squirrel. Cavity-nesting birds (including woodpeckers and secondary cavity users) feed on insects and play an important role in control of forest insect pests (Brown 1985).

Under natural conditions, snags occur throughout the forest when trees die as a result of fire, insects, or disease. Logging, safety concerns, and fire prevention measures have resulted in the elimination of snags from a significant portion in the planning area. Harvest on privately-owned land often involved leaving a few seed trees scattered throughout the area; however, most recent harvesting on private lands frequently has removed even these trees.

Many wildlife trees are small diameter (less than 15 inches dbh) snags or live trees; some are soft snags which do not provide future snag habitat. More importantly, several cavity-using species do not readily nest or forage in isolated trees in the middle of clearcuts or other openings (Schreiber 1987). Such reserve trees will not provide suitable habitat for these species until the regenerating stand matures in 60 to 80 years. Dead snags usually survive 20 to 30 years before they fall. Live green trees left in harvest units provide future snag habitat.

Current populations of the five dominant woodpeckers (hairy, downy, pileated, red-breasted sapsucker, and northern flicker) within the planning area are unknown. Even though there has been no population studies it is assumed since there has been a reduction in habitat, population trends are downward.

Six species of cavity users (house wren, Bewick's wren, violet-green swallow, tree swallow, mountain bluebird, and western bluebird) prefer early seral stages resulting from timber harvesting. Snag retention within harvest areas is necessary for these species.

Concerns have been expressed for species requiring large, down wood on the forest floor including amphibians, small mammals, and black bears (Maser and Trappe 1984; Maser et al. 1988; Raphael 1988; Noble et al. 1991). Short harvest rotation, thinning, and slash burning have reduced the amount of large down wood and may preclude development of this material in the future (Maser and Trappe 1984). Black bears prefer large rootwads as denning sites (Noble et al. 1990). Short rotations may preclude the availability of these rootwads in the future.

Riparian zones are of special concern. Priority species which use this zone as primary habitat are shown in Table 3-WL-1. In addition, many species benefit from the added diversity and modified micro-climate found in intact riparian zones.

Timber harvest on BLM-administered land has had a substantial negative effect on riparian habitat on many first and second order headwater streams throughout the planning area. Amphibians such as the Olympic salamander, Pacific giant salamander, and tailed frog that depend on cold, clear water, may be affected by these actions although these impacts have not been well documented. Bald eagle, osprey, and great blue heron, which often nest in riparian areas, also have been affected by modification of riparian vegetation. In some cases, gold mining has had a significant adverse effect on riparian habitat.

Special habitats (i.e., cliffs, talus, wet meadows, dry meadows, wooded swamps and bogs) provide elements of forest diversity important to many wildlife species (see Table 3-WL-1). For example, black bear and Roosevelt elk use wet meadows as forage and resting areas; mountain lions use cliffs and other rocky areas as hunting and resting areas (Harcombe 1976). Timber harvest activities, including road construction and yarding, quarry development, off-highway vehicle use, and communication site development have removed cover and created disturbances in special habitats, making them significantly less valuable.

Hardwoods provide primary habitat for many species of wildlife in the planning area, including white-breasted nuthatches, black-headed grosbeaks, and screech owls (see Table 3-WL-1). These stands often provide valuable hiding cover and forage for turkey and big game on migratory winter range (see Map 3-7). Some hardwood stands have been converted to conifer stands. These conversions have increased the trend towards monotypic, even-aged stands of second growth conifer. Other threats to hardwood habitat include the growth of urban and rural residential development and firewood cutting.

Neotropical migratory birds are those species which breed in North America and migrate to Central and South America to spend the winter. There has been increasing concern in recent years about the apparent widespread population declines of several of these species (French 1991). Causes of the declines are unknown but possible reasons include habitat loss on the breeding or wintering ranges, pesticide use, or other factors. There are 48 neotropical migratory bird species within the planning area. They use a variety of habitats, from hermit warblers which nest in conifer canopies to Nashville warblers which nest in shrubs. There are 16 species that are associated with early seral stages and 13 species that are associated with conifer canopies.

Fish

Streams, rivers, and other water bodies in the planning area contain substantial habitat for numerous fish species, especially salmon and trout. These habitats meet at least one of the life history requirements for 24 species of native and introduced nonsalmonid fish and 8 species or races of salmon and trout (see Appendix 3-F-1, Draft RMP). The descriptions and analyses in this document focus on priority fish species (see Table 3-F-1).

The potential of a stream to support fish is directly related to the quantity and quality of aquatic habitat, which, in turn, is closely associated with the condition of the riparian area. Logging activity in riparian areas and some logging techniques in upland areas have reduced the productivity of many streams on public and private lands. Fewer large trees result in less coarse woody debris, water storage, channel complexity and stability, and suitable water temperatures.

Of the 3,910 miles of streams second order and larger within the planning area, 529 miles support fish. Of those 529 miles, 264 miles support a combination of anadromous fish and resident trout (see Map 3-8 and Appendix 3-F-2, Draft RMP). Six reservoirs with BLM shoreline support fish. They occupy about 7,084 acres and have a maximum capacity of 585,927 acre feet.

Of the 264 miles of stream used by combinations of coho and chinook salmon, steelhead, and resident trout for spawning or rearing, 29 percent are in minimal condition and 37 percent are in good to optimal condition (see Table 3-F-1). Thirty-six percent of resident trout habitat not utilized by anadromous fish is in good/optimal condition.

Fish habitat condition trend on BLM-administered land is unknown because long-term monitoring has not been initiated. Recovery of stream habitat following a major disturbance such as logging is a slow and complex process requiring many decades. Factors influencing the recovery period and habitat trend include: the rate that stream shading returns to preharvest levels, the rate at which woody debris in a stream channel decreases through natural processes, the rate that coarse woody debris is contributed by the adjacent forest, and the rate of sedimentation from roads. All these factors are influenced by activities upstream on public land as well as on private land.

Riparian and watershed protection measures on public land, including road construction standards, have improved significantly during the past decade.

Table 3-F-1. Estimated Condition of Salmon and Trout Habitat

Priority Species	Stream Miles	Habitat Condition (Miles)[1]		
		Minimal	Fair	Good/Optimal
Chinook	79	6	15	58
Coho	94	37	36	21
Steelhead	264	81	82	101
Resident trout[2]	265	74	96	95

[1] Habitat data is for streams on BLM-administered land only.

[2] Habitat not utilized by anadromous fish. (Resident rainbow and cutthroat trout also utilize anadromous fish habitat.)

Table 3-F-2. Population Trends for Anadromous Fish in the Rogue River and Cow Creek Basins

	Coho Salmon		Fall Chinook Salmon		Spring Chinook Salmon		Summer Steelhead (Early Run)		Summer Steelhead (Late Run)		Winter Steelhead	
River Basin	**Population Trend**	**Percent Wild**	**Population Trend**	**Percent Wild**	**Population Trend**	**Percent Wild**	**Population Trend**	**Percent Wild**	**Population Trend**	**Percent Wild**	**Population Trend**	**Percent Wild**
Rogue (mid/upper)	Increasing[1]	50[2]	Increasing[3]	97	Stable[3]	50	Increasing[1]	46[4]	Stable	24[4]	Increasing[1]	90
Applegate	[5]	100	Increasing[3]	100[6]	N/A		[5]	100	[5]	100	Stable	60-80
Illinois	Decreasing	100	Decreasing	100	N/A		N/A		N/A		Decreasing	100
Cow Creek	Increasing	100[6]	Increasing	100	N/A		N/A		N/A		Stable	100[5]

[1] Hatchery production responsible for upward trend.
[2] Including Illinois and Applegate rivers. Rogue data cannot be isolated.
[3] Combined effects of dam operation and light commercial fishery.
[4] For the period 1976-89; half-pounders excluded.
[5] No data but trend is probably downward due to water diversion.
[6] Minimal but unquantified hatchery contribution. (Satterthwaite 1989; Fustish 1989; D. Liscia 1989)

In addition, most private forestlands are recovering hydrologically from extensive timber harvest during the 1950s, 1960s, and 1970s. However, frequent intervals of tractor logging in the same geographic area on private lands could slow recovery of stream habitat on public land, even though harvest activities may meet requirements of state forest practice rules.

Population trends of anadromous salmonids on all ownerships in the planning area vary considerably depending on river basin (see Table 3-F-2). Population status of resident trout is unknown.

Thirty-seven percent of all stream miles order 2 and greater in the planning area flow through BLM-administered land. Approximately 28 percent of streams on BLM-administered land are in minimal condition, 37 percent are in fair condition, and 35 percent are in good to optimal condition (see Table 3-F-3).

Upper Illinois River

Important fish species in the basin include winter steelhead, coho and fall chinook salmon, and resident cutthroat trout (see Table 3-F-4 and Table 3-F-5). All three are Bureau special status species (see Appendix G).

Illinois River coho salmon contribute virtually all of the Rogue Basin's wild production. Surface and ground water withdrawal by residential and irrigation users in combination with effects from timber harvest, mining, livestock grazing, land development, the current drought, and factors related to ocean survival have caused populations of coho and winter steelhead to decline steadily since the early 1970s.

The basin's fall chinook salmon have also declined in abundance but to a lesser degree than coho and steelhead. This could be because most emigrate for the basin in the spring before water temperatures increase and streamflow diminishes to critical levels.

Maximum temperatures (70° to 80°F) in the river and many tributaries contribute to poor growth, lower resistance to disease, as well as competition with and predation by warmwater nongame fish. Resident cutthroat trout have also probably declined in abundance in response to the same factors that are adversely affecting salmon and steelhead.

BLM and U.S. Forest Service lands in the headwaters of many tributaries remain the stronghold of fish production because of better water quality,

Table 3-F-3. Existing Condition of All Streams in the Medford District[1]

Stream Order	Habitat Condition (Miles)			
	Minimal	Fair	Good/Optimal	Total
2	613	838	758	2,209
3	279	381	344	1,004
4	126	151	123	400
5	48	63	56	167
6	13	21	19	53
7	14	8	7	28
8	0	5	3	8
9	0	0	40	40
Total	**1,093**	**1,467**	**1,350**	**3,910**

[1] BLM-administered land only.

Table 3-F-4. Distribution of Priority Fish Species in the Upper Illinois River Basin (BLM miles)

Stream Order	Coho	Fall Chinook	Winter Steelhead	Cutthroat
3	2	0	2	8
4	5	1	9	13
5	6	1	7	8
6	7	3	7	7
7	3	3	3	3
Total	**23**	**8**	**28**	**39**

Table 3-F-5. Existing BLM Stream Condition in the Upper Illinois River Basin[1]

Stream Order	Condition Class (Miles)			
	Minimal	Fair	Good/Optimal	Total
3	11	24	24	59
4	5	8	7	20
5	1	5	2	8
6	3	3	1	7
7	2	1	0	3
Total	**22**	**41**	**34**	**97**

[1] Deer Creek and Upper Illinois River analytical watersheds.

higher streamflow, and better physical habitat condition than on most other ownerships. However, poor habitat conditions at lower elevations could have a major influence on survival of juvenile salmon and steelhead produced on public land.

Jenny Creek Watershed

Of all stream miles below Howard Prairie and Keene Creek reservoirs, about 42 percent are in good condition, 46 percent are in fair condition, and 12 percent are in minimal condition (see Table 3-F-6).

About 26 miles of stream in the planning area support populations of redband trout and Jenny Creek sucker. Redband trout occupy an additional 25 miles of habitat upstream of features that are barriers to Jenny Creek sucker migration. Both are category 2 fish species (USDI, F&WS 1991). One or both species inhabit 14 percent of order 3 stream miles, 50 percent of order 5 stream miles, and all miles of stream orders 6 and 7.

Temperatures of many streams in the Jenny Creek watershed exceed 70°F during summer months. These thermal levels exceed state-established standards. Jenny Creek may have been prone to elevated water temperatures before the region was settled in the 1800s due to the stream's general north-south orientation. In addition, it has a relatively wide channel, slow water velocity, areas of bedrock stream-bed that cause shallow water depth, and a narrow riparian zone bordered in some locations by a white oak/ponderosa pine/manzanita-wedgeleaf/grass vegetative community. The 1964 flood influenced stream channel morphology and riparian zone characteristics.

However, several human-related factors have contributed to unnaturally high water temperatures. About 30 percent of the watershed's potential annual runoff is captured by a series of reservoirs and diverted to the Rogue River basin by the Talent Irrigation District. This situation probably results in less streamflow during the summer. Other factors include local water diversions from Jenny Creek and several of its tributaries, removal of riparian vegetation, streambank trampling and widening of the stream channel by livestock, and timber harvests that failed to retain adequate shade on perennial streams.

Beaver may have had a significant beneficial influence on summer streamflow and water temperature in Jenny Creek prior to livestock grazing in the 1880s. Beaver, which are common in the adjacent Johnson Creek watershed on private timber land and meadow, are not numerous in Jenny Creek downstream from Highway 66 where the stream gradient is low but where most of the riparian zone has been grazed by livestock for about 100 years.

After cattle are introduced into riparian habitat, there is often a gradual decline in stands of woody riparian species because beaver harvest mature plants and cattle harvest or trample new generation (Munther 1981). Although beaver-constructed ponds and harvested riparian vegetation would have contributed to elevated water temperature, benefits of cool ground water stored in streambanks and released

Table 3-F-6. Existing Stream Condition in the Portion of the Jenny Creek Watershed Downstream of Howard Prairie and Keene Creek Reservoirs

	Habitat Condition (Miles)[1]			
Stream Order	**Minimal**	**Fair**	**Good/Optimal**	**Total**
2	9	26	27	62
3	4	112	12	28
4	0	3	8	11
5	0	3	0	3
6	0	3	0	3
7	0	4	0	4
Total	**13**	**151**	**47**	**111**

[1] BLM-administered land only.

over several months would have been more important. The species may have gradually decreased in abundance because of a diminishing food source; trapping may also have reduced the population.

Four reservoirs in the headwaters of Jenny and Keene creeks prevent natural hydrologic functioning of both stream systems. Although on-site studies have not been conducted, it is probable reservoirs have reduced the frequency of bedload movement and the size of materials transported during periods of high streamflow. Periodic displacement of streambed materials is crucial. Reasons include:

- maintaining healthy communities of aquatic insects in riffle habitats,
- maintaining potential pool depth,
- maintaining suitable spawning habitat for salmonids,
- depositing bank-building sediment on stream margins, and
- maintaining crevices among rocks which fish use to escape high water velocity.

Sedimentation from landslides, livestock grazing in riparian zones, and unsurfaced roads has probably caused loss of aquatic productivity throughout the watershed.

Special Status and SEIS Special Attention Species Habitat

Species limited in abundance and distribution and that have identifiable threats to their existence are managed by the Bureau as special status species. This section discusses plant species followed by animal species. Categories of special status species are:

- Federal threatened or endangered,
- Federal proposed,
- Federal candidate (Category 1 and 2),
- State threatened or endangered,
- Bureau-sensitive, and
- Assessment species.

Plants

The planning area is within one of the most botanically diverse areas in the State of Oregon. The unique geologic and climatic history of the Siskiyou Range of the Klamath Mountains in southwestern Oregon provides habitats for a large number of endemic plants. Some are located almost exclusively in the planning area.

There are no federal listed or proposed plant species in the planning area. Federal candidate and Bureau-sensitive species known or suspected to occur are listed in Appendix G. The State of Oregon has officially listed the Umpqua mariposa lily (*Calochortus umpquaensis*) and Cook's desert parsley (*Lomatium cookii*) as endangered species. These species are also federal candidate species. Currently the U.S. Fish and Wildlife service is working on proposing Cook's Lomatium (*Lomatium Cookii*) as a federal endangered species. See Chapter 2 for Special Status Species (Plants) for proposed future management actions for these species.

These SEIS vascular plant species identified as needing special management attention are identified in Appendix G. Four species are known to occur on the Medford District, *Bensoniella oregana, Cypripedium fasciculatum, Cypripedium montanum*, and *Allotropa virgata*. These species will be considered under Medford District's Special Status Plan Species Program. Detailed information about all of these species is outlined in Appendix J-2 of the FSEIS.

Inventories for special status plants are conducted in conjunction with timber sales, other surface disturbing activities, and land exchanges. Specific inventories determine the distribution and abundance of the species. Monitoring is conducted to determine condition, trend, and ecologic requirements for federal candidate species.

Since 1980, approximately 100,000 acres of the planning area have been inventoried for special status plants.

The following is a brief overview of the federal candidate plant and SEIS special attention plant species known to occur on the Medford District.

Applegate's Stonecrop (*Sedum oblanceolatum Clausen*)

Sedum oblanceolatum Clausen, a member of the Crassulaceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

It was given the name Applegate stonecrop because the few known locations all occur in the drainage system of the Applegate River located in the Siskiyou Mountains of Jackson County, Oregon. It has a known range of only 20 kilometers. This species can be found growing on dry, dioritic slopes, and rocky outcrops that are usually sparsely vegetated and surrounded by shrubs and scattered trees.

Because of its remote locations on rocky slopes, human disturbances and forestry practices are not a great threat, although the building of new roads could be a source of concern. Perhaps the greatest threat is limited genetic variability due to its small range.

Two monitoring plots were established in 1985 to observe the population dynamics of *Sedum oblanceolatum* on a yearly basis.

Bensonia (*Bensoniella oregana* (Abrams & Bacigalupi)) Morton

Bensoniella is presently listed by U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993). It is also a SEIS Special Attention Species (Record of Decision 1994).

Bensoniella is an inconspicuous monotypic genus of the Saxifragaceae family that occupies a restricted range in the coastal portions of the Siskiyou Mountains of southern Douglas, western Josephine and Curry counties, Oregon. There is one disjunct population in Humboldt County, California. In Oregon, the distribution centers around two focal points, the high country in Josephine County south of the Rogue River between Galice and Agnes in the Bear Camp Lookout area, and the other to the southwest in Saddle Mountain-Collier Butte area in central Curry County. These populations account for 99 percent of the known plants. The greatest portion of Bensonia's habitat occurs on the Siskiyou National Forest. The Medford District manages sites in the Bear Camp area and in southern Douglas County around Anatuvak Saddle.

Bensoniella grows in very specific meadow and stream edge habitat on soils derived from ancient sedimentary rocks. Crucial factors include soil depth and soil moisture. Most of the large populations are in moist slump meadows in the upper parts of drainages. The Medford District is currently working on a management plan for *Bensoniella*. Threats to this species include alteration of hydrology patterns, removal of overstory canopy, or constructing roads through habitat.

Clustered Lady's Slipper (*Cypripedium fasciculatum* S. Watson.)

The Clustered Lady's Slipper, a member of the Orchidaceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993). It is also a candidate for state listing and a SEIS special attention species (Record of Decision 1994).

The Clustered Lady's Slipper is a small orchid which is widely distributed from southern British Columbia to California and isolated spots in eastern Oregon, Idaho, Utah, Montana, and Wyoming. Although it occurs in a variety of habitat types, few individuals occur at any one site. Little is known about the life cycle, however, several years are necessary from seed to flowering plant. The Medford District has 128 reported sites, with most sites having one 1 to 10 plants.

Threats to the Clustered Lady's Slipper are fragmentation of habitat, fire suppression, collection for horticultural purposes, and habitat alteration through timber harvest.

Cook's Lomatium (*Lomatium cookii* Kagan)

Lomatium cookii Kagan, a member of the Apiaceae or carrot family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 1 species (Federal Register, Notice of Review, 1993), and is also listed as endangered by the State of Oregon (1989, OAR 603-73-070(1)). The USFW Service is currently preparing a notice of review for listing of this species.

This perennial plant, known as Cook's parsley, was first described from plants on the Agate Desert of the Rogue River Valley in Jackson County, Oregon. The habitat is patterned ground characterized by a series of vernal pools and intermounds, with grasses, and herbaceous annuals and perennials as the major vegetation. The other known populations occur in the Illinois Valley of Josephine County. The largest population in the Illinois Valley is growing on open, flat ground in areas that has a high soil moisture content in the spring before quickly drying out in early summer. This habitat site is in the proposed French Flat ACEC.

In 1990, a monitoring program was established near French Flat in the Illinois Valley to track the demographics of *L. cookii* on a yearly basis, gain an understanding of its life cycle, and to further information on population structure and reproductive biology. Information on net reproductive rate, population structure, and factors influencing fecundity will provide insight on conditions affecting the growth or decline of the population (Lesica 1987). In 1993, monitoring was increased to provide data for documenting population viability and extinction probability over time.

On the Agate desert, threats to this species consist of loss of habitat due to grazing and land development. Mining and off-highway vehicle use are a threat to this species' habitat at French Flat, in Josephine County.

Coral-Seeded Allocarpa (*Plagiobothrys figuratus* (Piper) Johnst. ssp. *corallicarpus* (Piper) Chamb.)

Plagiobothrys figuratus ssp. *corallicarpus*, a member of the Boraginaceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Coral-seeded allocarpa known only from historic records from the Grants Pass and Medford areas was thought to possibly be extinct until it was rediscovered on the Dead Indian plateau in Jackson County in 1991. Inventory done in 1993, in conjunction with the Siskiyou Chapter of the Native Plant Society of Oregon (NPSO), located 19 new sites with 4 being on the Medford District. It appears that P. figuratus ssp. corallicarpus is restricted to the Sams Valley area and to an area south and west of Grants Pass and that the Lincoln site is an anomaly (Brock 1992). The habitat is associated with vernal wet areas in rocky, open grassland meadows. These areas are wet in the spring but are very dry in the summer.

A distinguishing feature of the coral-seeded allocarpa that differentiates it from other *Plagiobothrys* in southern Oregon is the larger flowers.

Extended or intensive periods of livestock grazing is the primary threat to this species; habitat. Additionally, changes in the seasonal hydrology pattern and/or encroachment by invasive nonnatives pose a threat to this species.

Detling's Microseris (*Microseris lancinata* (DC) ssp. *detlingii*)

Microseris lancinata ssp. *detlingii*, a member of the Asteraceae or sunflower family, is presently listed by USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

This taxon is endemic to southwestern Oregon in Jackson County. The known range is from Lake Creek north of Grizzly Peak south to the California border,with most plants being known in the Siskiyou Pass area. *M. Lancinata* ssp. *detlingii* grows on clay type soil which has developed from volcanic tuffs.

The Medford District manages 3 populations number greater than 1,000 per site. A major threat to these populations is grazing by wildlife and cattle.

Dwarf Meadowfoam (*Limnanthes floccosa* How. ssp. *pumila* (Howell) Arryo)

Limnanthes floccosa ssp. *pumila*, a member of the Limnanthaceae or meadowfoam family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 1 species (Federal Register, Notice of Review, 1993).

The dwarf meadowfoam is endemic to the tops of the two basalt mesas known as the Upper and Lower Table Rocks. These mesas are located in west central Jackson County in southwestern Oregon. This meadowfoam is found growing nowhere else in the world except on the tops of these two mesas. The habitat of this winter annual is the edges and slopes of the vernal pools.

The BLM, private landowners, and The Nature Conservancy are owners of the Table Rocks. The Medford District manages their lands on the Table Rocks as an ACEC.

The most imminent threat to the *Limnanthes* habitat is from overuse by environmental education hikes by school groups and the public; monitoring is occurring to determine if this is happening.

Gentner's Fritallary (*Fritillaria gentneri* Gilkey)

Fritillaria gentneri Gilkey, a member of the Liliaceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993). F. gentneri grows in Jackson and Josephine counties of southwestern Oregon, with the majority of its populations occurring on the lower slopes and bottom land of the Rogue River Valley near Jacksonville and Gold Hill. The small populations are scattered beneath open canopies of oak woodland and among chaparral shrub communities. Although several sites have been found, the majority of these are very small, often comprised of only a few individuals. Most of the populations occur on private land, except for five on BLM-administered lands. Because *F. gentneri* most often inhabits the lower slopes of the Rogue River Valley, it is seriously threatened by the rapidly increasing development of new homes. A low reproductive success rate, the result of aborting capsules and animal grazing, are all factors controlling the growth of populations. Research, monitoring, and inventory are being conducted on this Fritillaria.

Glandular Stonecrop (*Sedum moranii* Clausen)

Sedum moranii Clausen, a member of the Crassulaceae or stonecrop family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Commonly referred to as the Rogue River Stonecrop, this succulent perennial grows in the Rogue River canyon of Josephine County, Oregon, with a distribution of less than 2 kilometers in diameter and ranges in elevation from 210 to 220 meters (Clausen 1975). It is found on serpentine rock outcrops and in drainages, often growing among moss and Sellaginella.

Recreational use along the Rogue River is the major threat to this species. The majority of the populations occur near hiking trails, campgrounds, and boat launching ramps. This increases the chance of impacts by recreationists and plant collectors. Roadside spraying for road maintenance could also be a problem. Perhaps the greatest threat is the limited genetic variability this species possesses. Clausen (1975) states that "all plants of the *S. moranii* could belong to as few as four clones".

Green's Mariposa Lily (Calochortus greenei Wats.)

Calochortus greenei Wats., a member of the Liliaceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Commonly referred to as Green's mariposa lily, this species is found growing in five main areas within Jackson County, Oregon, and north-central Siskiyou County, California. Its historic range indicates that it was more widespread once than it is today. Populations in the northern part of *C. greenei*'s geographic range occur in the Siskiyou Pass and Agate Flat areas of Jackson County. In Siskiyou County, populations occur in the Ager region, Table Rock (the southern extension of the range), and in the East Shasta Valley, and Little Shasta Meadow. Chaparral communities on gradual east and west facing slopes are the preferred habitat, with most populations occupying rocky slopes and small openings among shrubs on clay soil.

Population sizes vary greatly from year to year due to periodic dormancy related to environmental factors. A major impact on these populations is grazing by wildlife and cattle, which cause low reproductive success rates.

Monitoring has been conducted to gain information on population structure and reproductive biology. Information on net reproductive rate, population structure, and factors influencing fecundity will provide insight on conditions affecting the growth or decline of the population (Lesica 1987).

A land exchange by the Medford District to acquire 222 acres of habitat for this species was completed in 1993.

Howell's Camas (*Camassia howellii* S. Watts)

Camassia howellii, a member of the Lily family, is presently listed by U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Howell's camas is a narrow endemic with its main center of focus around Sexton Mountain in Josephine County, Oregon. The distribution of this species may be more restricted than previously thought. As historic sites are reinventoried, some are found to not be Howell's camas. Identification can be difficult if not done at the proper time, with the capsule being one of the most distinguishing characteristics.

In some sites, *Camassia howellii* occurs sympatric with other camas. *C. howellii* occupies the drier, rockier serpentine slopes with the more common Camassia occurring in the wetter areas.

Howell's Lewisia (*Lewisia cotyledon* (Wats) Rubins ssp. *howellii* (Wats.) Hohn)

Lewisia cotyledon ssp. *howellii*, a fleshy perennial in the Portulaceae family, is a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Howell's lewisia is endemic to southwestern Oregon and northern California. This lewisia is similar to the type variety but has crisp undulate leaf margins. It occurs on rocks or shallow soils at a lower elevational range than any of the other infraspecific taxa of *L. cotyledon*.

The Medford District has 13 populations of Howell's lewisia occurring in all 4 resource areas. Potential threats to populations could be collecting, as it is a popular rock garden species. However, it can be purchased from local nurseries where the plants are grown from seed.

Howell's Mariposa Lily (*Calochortus howellii* Wats.)

Calochortus howellii Wats., a member of the Liliaceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Commonly referred to as Howell's mariposa lily, this species is restricted to open, rocky serpentine slopes among Jeffrey pine forests and often in the dry areas adjacent to the Darlingtonia fens. Its range is in southern Josephine County, Oregon and extends from Selma to Oregon Mountain in the upper Illinois River drainage.

The greatest threat to *C. howellii* is the mining of nickel, chromite, and cobalt, which are abundant minerals in serpentine soil.

Howell's mariposa occurs at Eight Dollar Mountain, an area of critical environmental concern (ACEC), and at Woodcock Bog Research Natural Area (RNA), both in the Illinois Valley.

Howell's Microseris (*Microseris howellii* Gray)

Microseris howellii Gray, a member of the Asteraceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Howell's microseris is a slender perennial, found growing in Curry and Josephine counties in the Siskiyou Mountains of Oregon. This *Microseris* is restricted to dry, and rocky serpentine soils supporting grassland savannahs, open brush fields, and open Jeffrey pine forests. It usually occurs at elevations under 3,200 feet. *Microseris howellii* occurs at Woodcock Bog RNA and the Eight Dollar Mountain ACEC. Mining and urban development on the valley floor are potential threats to this species' habitat.

Large-Flowered Rush-Lily (*Hastingsia bracteosa* Wats.)

Hastingsia bracteosa Wats., a member of the Liliaceae family, is designated by the U.S. Fish and Wildlife Service as a federal candidate, category 1 species (Federal Register, Notice of Review, 1993).

The large-flowered rush lily is restricted to serpentine soil in wet areas and Darlingtonia fens on the west side of the Illinois Valley in Josephine County, Oregon.

The greatest threat to *H. bracteosa* is the mining of nickel, chromite, and cobalt, all abundant minerals in serpentine soil. Diversion of water in the fens is a threat to the habitat of this species, as well as off-highway vehicle recreation. Grazing by herbivores appears to be another threat for this species.

Medford District manages nine sites with six of these in the Eight Dollar Mountain ACEC.

Mountain Lady's Slipper (*Cypripedium montanum* Douglas)

Cypripedium montanum, or Mountain Lady's Slipper, a perennial species in the Orchidaceae family, is a SEIS Special Attention Species (Record of Decision 1994), occurs from Southern Alaska, British Columbia, Vancouver Island and western Alberta, south to Montana, Idaho, Washington and California (Hitchcock et.al. 1969). In Oregon, it is found on both the east and west slopes of the Cascades. The habitat for the species is considered broad with populations being small in number of plants (FSEIS Appendix J2, 1994). Specific fungi are required for germination and establishment of new plants (FSEIS Appendix J2, 1994). Threats to the species include fire suppression, logging, and the probable horticultural collection of plants, resulting in the decline of this species (SEIS Appendix J2, 1994).

The Medford District has several sites with between 1 and 10 plants per site. One population has over 300 individuals. In 1984, the district began a long-term monitoring study to determine effects of different timber harvesting regimes on *C. montanum*. Permanent plots were located in control areas, shelterwood areas, a 1966 clearcut, and a 1984 clearcut. The first 10 years of data will be analyzed in 1995.

Oregon Willow Herb (*Epilobium oreganum* Greene)

Epilobium oreganum Greene, a member of the Onagraceae family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review. 1993). It is also a candidate for state listing (Oregon Natural Heritage Program (ONHP), 1993).

The Oregon willow-herb is known from a few scattered sites in Josephine and Douglas counties, Oregon, and northern California. Its habitat is wet sites and Darlingtonia fens at low elevations. It is an inconspicuous plant and often difficult to see growing among the other vegetation.

The greatest threat to this species is the mining of nickel, chromite, and cobalt, which are minerals found in serpentine soil. Water diversion of the fens has also been a problem in the past, as well as off-highway vehicle recreation.

Purple-flowered Rush Lily (*Hastingsia atropurpurea* Becking)

Hastingsia atropurpurea Becking, the purple-flowered rush lily is a member of the Liliaceae family. It is a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

This purple form of the rush lily was described by Dr. Rudolph Becking in 1986, taxonomically differentiating the white form from the purple form. The purple-flowered rush lily is restricted to serpentine soil in wet areas and Darlingtonia fens on the west side of the Illinois Valley.

The Medford District manages 6 sites with 3 at Woodcock Bog RNA.

The greatest threat to this species is the mining of nickel, chromite, and cobalt which are minerals found in serpentine soil. Water diversion of the fens has also been a problem in the past, as well as off-highway vehicle recreation.

Purple Toothwort (*Cardamine gemmata* Greene)

The Purple toothwort, a member of the Brassicaceae or mustard family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

This perennial toothwort is found in southern Josephine and Curry counties, Oregon, and Del Norte and Siskiyou counties, California. Medford District manages four populations of *Cardamine gemmata*. More inventory is needed for this species.

Pygmy Monkey Flower (*Mimulus pygmaeus* A.L. Grant)

Mimulus pygmaeus A.L. Grant, a member of the Figwort family (Scrophulariaceae) is a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

This pygmy monkey flower's distribution is from southwestern Modoc County, California, to southern Jackson and Klamath counties in the southern Cascades. This minuscule annual is restricted to moist soil areas in meadows, along streams, and the muddy edges of desiccating vernal pools on flat or stony ground. True population data on this annual is difficult to attain as it is very small in size, 5 to 15 millimeters, which makes it inconspicuous and often overlooked.

The Medford District has 22 known sites. One of these occurs in the proposed Round Top RNA.

Red-Root Yampah (*Perideridia erythrorhiza* (Piper) Chuang and Const.)

Perideridia erythrorhiza (Piper) Chuang and Const., a member of the Apiaceae or carrot family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

This species is restricted to Douglas, Klamath, and Josephine counties. Its habitat includes drying swales in open prairies, moist meadows, pasture land, and edges of coniferous forests. It occurs at elevations of 500 to 5,000 feet, most often in heavy, poorly drained soils.

Commonly referred to as red-root yampah, it can be distinguished from other Perideridia by its clusters of reddish tuberous roots and the narrow, multi-nerved petals. *P. oregana*, which is frequently found growing with the red root yampah, has glaucous white and stout stems in contrast to the green, flimsy stems of *Perideridia erythroriza*. *P. oregana* also seems to bloom slightly earlier than *P. erythrorhiza*. The red-root yampah occupies the wetter sites.

The only known site in the planning area is at Eight Dollar Mountain ACEC.

Siskiyou Butterweed (*Senecio hesperius* Greene)

Senecio hesperius Greene, a member of the Asteraceae or composite family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Commonly referred to as the Siskiyou butterweed, this species is restricted to serpentine soil in Josephine County, Oregon. The majority of its populations occur in the Illinois Valley of the Siskiyou Mountains. It can be found growing in open Jeffrey pine-grassland savannahs and shrubby woodlands on dry, rocky slopes in the full sun at fairly low elevations.

Although locally common in areas of the Illinois Valley, this serpentine endemic has a very restricted distribution. Because of its limited range, it is particularly vulnerable to threats including nickel mining, grazing, and recreational activities.

Monitoring plots have been established at Eight Dollar Mountain ACEC and Woodcock Bog RNA, respectively. The purpose of this monitoring is to track the demographics of *Senecio hesperius* on a yearly basis to gain an understanding of its life cycle. This information includes population structure, percent of population that is reproductive, and percent of potential reproductive output lost to abortion and predation.

Slender Meadow Foam (*Limnanthes gracilis* Howell var. *gracilis*)

Limnanthes gracilis var. *gracilis*, a glabrous annual, is a member of the Limnanthaceae family. It is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Slender meadowfoam is restricted to the Rogue and Illinois Valleys of Jackson and Josephine counties and a few sites in Douglas County. It is found growing in moist to wet sites in the early spring, often on serpentine soils.

The Medford District has 20 sites in Josephine County.

Southern Oregon Buttercup (*Ranunculus austro-oreganus* Bens.)

Ranunculus austro-oreganus Bens., a member of the Ranunculaceae or buttercup family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Commonly referred to as the Southern Oregon Buttercup, this species is endemic to central Jackson County, Oregon, occurring in oak woodland-savannah and grassland communities on the lower elevation slopes of the Rogue River Valley. It is found growing on the south slopes of Upper Table Rock and at Emigrant and Agate lakes. The threats of grazing, agriculture and urban development are pronounced since this species is so restricted in its range.

The Medford District manages eight sites of this buttercup. One population is on the Table Rocks ACEC. This ACEC is managed for the endemic plant species that occur within it. The populations appear to be stable.

Sugar Stick (*Allotropa virgata* Torrey & Gray)

Allotropa virgata is a perennial species in the Ericaceae family. It is an SEIS Special Attention Species (Record of Decision 1994) occurring from the east slope of the Cascade to near the coast, from British Columbia to California (Hitchcock and Cronquist 1973). The habitat for the species includes closed canopy pole, mature and old growth seral stages in *Pseudotsuga menziesii*, and other coniferous forest types. Threats to the species include fire suppression, fragmentation of habitat, and reduction in coarse woody debris, all leading to a decline in the species (SEIS Appendix J2, 1994).

Because this species was not previously identified as a BLM Special Status Plant Species, the district has not been tracking this plant. There are occurrences of it on the district but exact data is not available.

Tall Bugbane (*Cimicifuga elata* Nutt.)

Cimifuga elata Nutt., a member of the Ranunculaceae or buttercup family, is designated by USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993). It is also a candidate for state listing.

Tall Bugbane is a plant of forested habitats west of the Cascades in Oregon, Washington, and British Columbia. First reported in southwestern Oregon within the last three years, the Medford District manages four populations which are the southern most populations of this species. The plants in these southern populations are much more robust and the panicles are upright, whereas northern plants are smaller with drooping panicles. The first year study done on *C. elata* by Oregon Department of Agriculture, reports that numbers of plants are usually fewer than 100, and often fewer than 25. The populations on the Medford District number up to 2,000 per site.

Threats include habitat alteration by timber harvesting activities.

Umpqua Calachortus (*Calochortus umpquaensis* Fredrick)

Calachortus umpquaensis Fredrick, member of the Liliaceae family, is designated by the USFW Service as a federal candidate, category 1 species (Federal Register, Notice of Review, 1993). It is also listed as endangered by the State of Oregon (1989, OAR 603-73-070(1)).

Calachortus umpquaensis is known to exist from Douglas County south of the Umpqua River to two sites in northern Josephine County. The species is restricted to serpentine-derived soils predominately on grassland-forest ecosystems. The Medford District manages two sites for the Umpqua mariposa lily. An interagency management plan is being prepared for the Umpqua Calochortus.

Umpqua Swertia (*Frasera umpquaensis* Peck and Appleg.)

Frasera umpquaensis is presently listed by the USFW Service as a federal candidate 2 species (Federal Register, Notice of Review, 1993). The Umpqua swertia is also a candidate for state listing threatened or endangered (1991, OAR 603-73-080).

A BLM/U.S. Forest Service Interagency Habitat Management Plan/Species Management Guide for this species has been prepared to address the long-term management of this species throughout its range in Oregon. Frasera is a perennial species and belongs to the Gentianaceae family.

The species' range extends from northern California to the westside of the Oregon Cascade Range in the southern end of Lane County, Oregon. Umpqua swertia is found at mid to high elevation sites in open forest, meadow and forest/meadow edges. The primary concentration of the species occurs in southern Oregon at the Rogue/Umpqua Divide with several other populations being disjunct from this population center. Habitat has declined due to past forest management activities and the natural successional changes of meadow and meadow/forest edges to closed forest conditions. Other threats to the populations have been identified, such as low rates of seed germination, isolated populations, seed predation, and lack of seedling recruitment into some populations.

The Medford District manages one population of *Frasera umpquaensis*. This site will be part of the interagency monitoring plan to assess the species throughout its range in Oregon and to track the Frasera population at this site.

Waldo Gentian (*Gentiana setigera* Gray)

Gentiana setigera Gray, a member of the Gentianaceae family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993). *G. setigera* was previously known as *G. bisetea*.

This species is restricted to wet areas, fens, and marshes usually at lower elevations on serpentine soil in the Siskiyou Mountains of Josephine and Curry counties, Oregon, and Red Mountain in Mendocino County, California.

The greatest threat to this species is the mining of nickel, chromite, and cobalt which are minerals found in serpentine soil. Water diversion of the fens has also been a problem in the past, as well as off-highway vehicle recreation.

The gentian is being monitor at Eight Dollar Mountain ACEC and at Woodcock Bog RNA, both in the Illinois Valley of Josephine County. The purpose of this monitoring is to track the demographics of *Gentiana setigera* on a yearly basis, and gain information on population structure, reproductive biology, and effects of environmental change on the gentian.

Western Bog Violet (*Viola primulifolia* L. ssp. *occidentalis* (Gray) L.E. McKinney & R.J. Little)

Viola primulifolia ssp. *occidentalis*, a member of the violaceae family is designated by USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993). It is also a candidate for state listing.

The western bog violet is restricted to Curry and Josephine counties in southwestern Oregon, and Del Norte County, California. This is the only violet found growing in real wet areas such as sphagnum bogs and Darlingtonia fens.

The Medford District manages seven sites for this species which are all located along the west side of the Illinois Valley. One is in Woodcock Bog RNA, and one is located at Eight Dollar Mountain ACEC. Potential threats would include any activities which alter the perennial wetness regime of the habitat sites.

Western Sophora (*Sophora leachiana* Peck)

Sophora leachiana Peck, a member of the Fabaceae family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

Western Sophora is endemic to southwestern Oregon, with its populations occurring in Josephine County. The known range for western sophora is between the Rogue River and the Illinois River. This perennial, which produces aerial shoots from its rhizomes, tends to produce few viable seeds. It tends to be a primary colonizer of open, disturbed areas within mixed evergreen forests, often becoming the dominant species in the herbaceous layer (Crowder 1979). This species is usually found on south- or southwest-facing slopes at low to mid elevations. Its vegetatively reproducing colonies are threatened by road building, roadside spraying, and mining activities. Because western sophora prefers small openings in forests and germination is triggered by heat (Crowder), fire suppression may also be a source of concern. The Medford District BLM manages seven sites of western sophora.

Wooly Meadowfoam (*Limnanthes floccosa* ssp. *bellingeriana* (Peck) Arroyo)

Limnanthes floccosa ssp. *bellingeriana*, a member of the Limnanthaceae or meadowfoam family, is designated by the USFW Service as a federal candidate, category 2 species (Federal Register, Notice of Review, 1993).

The distribution of the wooly meadowfoam is Jackson County, Oregon, and Shasta County, California. Medford District manages six populations of this meadowfoam in the southern Cascades. Two more populations occur in Shasta County. *Limnanthes* is a winter annual occurring in colonies on wet sites. The wooly meadowfoam inhabits stony meadows at elevations of around 4,000 feet. Two of the populations are near highways and vulnerable to disturbance. One site, Poverty Flat, has been proposed as an ACEC.

Bryophytes, Lichens, and Fungi

A variety of bryophytes (mosses, liverworts, and hornworts), lichens, and fungi occur within the Medford District. The distribution and abundance of various species within the differing groups of organisms has not been well-documented. An inventory is currently being done for bryophytes and lichens in the Little Applegate watershed.

Data is being collected on rare species that may occur on the district, as well as the more common species. Abstracts are currently being developed that describe the rare bryophytes suspected on the Medford District, what types of habitats they are likely to occupy, and how best to inventory for these organisms within the district. This information will be used in implementing future inventories for these organisms.

No research or inventories have yet been implemented for forest fungi within the Medford District, except for a study on Matsutake being conducted by Oregon State University. See Appendix J-2 in the FSEIS for proposed future management actions concerning lichens, bryophytes, and fungi.

Fungi, bryophytes, and lichens provide a wide array of ecosystem functions. The Forest Ecosystem Management Report (1993) lists several of these, all of which are relevant for species within the Medford District. Some of these ecosystem functions are as follows:

- Fungi provide food and cover for a wide variety of vertebrate and invertebrate species. Mycorrhizal or fungal connections with vascular plants, including conifers are essential for uptake of nutrients and water, and the maintenance of many vascular plants. Fungi play vital roles in the decomposition and recycling of nutrients, providing organic matter for the formation of forest soils. Certain disease fungi that result in tree mortality, provide for the formation of forest gaps that add structural complexity to the forest, which a wide variety of wildlife, plant, and fungal species utilize. Specific fungi, such as Chanterelles and Matsutake, are important special forest products within the Medford District.

- Lichens contribute to nutrient cycling and biomass production. They are critical in providing food for vertebrates and invertebrates. Lichens capture fog and retain moisture in the canopy, helping to regulate forest climate. Forest lichens, such as *Lobaria oregana*, fix atmospheric nitrogen, making it available for other plants to utilize. Lichen litterfall provides organic material to forest soils and increases the soil moisture holding capacity. Because lichens are sensitive to certain air pollutants, lichens are being used to monitor air quality on adjacent forestlands. Lichens are also being used in the floral and craft industry and are a source of natural dyes.

- Bryophytes contribute large amounts of biomass to the understory of forest communities. They provide food and habitat for a variety of vertebrates and invertebrates. Bryophytes also plan an important role in nutrient cycling. They add to soil nutrients, soil structure, soil stability, and interception and storage of water. Bryophytes can filter sediments and organic matter. Certain moss species are important special forest products, which are used in the floral industry.

Because of the recent reductions in acres of mature and old growth forests, emphasis has been given to the management and inventory of those lichens, bryophytes, and fungi found in mature and late-successional forest ecosystems. Species that are considered in need of special management and/or inventory efforts are listed in Appendix G. It is not currently known which of these organisms occur on the Medford District. See Chapter 2, Special Status and SEIS Special Attention Species Habitat, and Appendix G for proposed future management actions for these species when found through inventory.

Although complete species lists have not been fully developed for these organisms, it is clear that these nonvascular plants and fungi are important organisms within the district. Specific habitat features and ecological processes known to be important for supporting these organisms in late-successional forests were identified in the Forest Ecosystem Management Report (FEMAT 1993). These features and process do occur within the Medford District and are summarized below:

- Late-successional forests are critical for the maintenance of various species of fungi, lichens, and bryophytes. Small fragments (5 to 40 acres) of old growth, as well as larger contiguous late-successional forests, are important for the maintenance of these organisms. Forest fungi and bryophytes rely on course woody debris as substrates and as a source of moisture. Diversity for these organisms is abundant in areas where a variety of tree species form diverse plant communities and complex forest structure. For example, old growth conifers with emergent crowns and large limbs support diverse lichen communities. Actions such as the retention of legacy trees may be important as a source of lichen inoculum for surrounding younger forests.

- Various forest processes are also important for the maintenance of these organisms. Fine scale disturbances, such as the formation of forest gaps, produce diverse stand structure which drives the development of microsites important for fungi, lichens, and bryophytes. In contrast, some lichen species rely on more stable forest ecosystems where large scale events such as wildfire have been absent for hundreds of years. Special habitats, including riparian areas, rock outcrops, seeps, springs,and hardwood forests are all important habitats for maintaining the diversity of lichens and bryophytes within the district.

- Maintenance of various physical parameters is critical for these organisms, including such things as wetting and drying cycles, fluctuations in water flow and quality.

Species diversity appears to increase for lichens, fungi, and bryophytes as forest ecosystems mature toward late-successional conditions. Many species found in older forests do not survive or compete well in younger forests. Early successional forests are important in supporting other fungi, etc. Changes in light, moisture, and duff layers, and a host of other environmental and physical factors, will alter which organisms will be present. Forests of approximately 50 to 60 years old, for example, can provide habitat for the popular edible mushroom, the Chanterelle. Ecosystem processes, resulting in early seral conditions, are also significant factors shaping the species composition of a given area. For example, species that appear to respond favorably to fire, such as the edible Morel mushroom, may not be as abundant on the Medford District as in historical times, due to fire suppression and the reduction in broadcast burning as a site preparation technique. In general, however, the abundance of younger forests within the Medford District and the species that rely on these conditions, including early to mid-seral fungi, lichens, and bryophytes, are thought to be abundant and well-distributed.

Animals

There are two federal threatened, two federal endangered, eight candidate or proposed vertebrate species, and nine invertebrate species. Not all species are discussed in detail, either because their distribution within the planning area is limited or their presence would have no effect on planning decisions (see Appendix G).

Bald Eagle

Bald eagles are federal listed as a threatened species. The Pacific Bald Eagle Recovery Plan, prepared by USFWS, is being implemented by BLM and cooperating agencies (USFWS 1986).

There are five known nesting pairs of bald eagles on BLM-administered land and two pairs on private land within the planning area. This is an increase from the two known sites in 1980. Inventories of wintering bald eagles generally find about four birds using the planning area.

Bald eagles in the Pacific Northwest nest primarily in ponderosa pine, mixed-conifer, Douglas-fir, and sitka spruce/western hemlock forest types in large old growth trees (Anthony et al. 1980). Eighty-four percent of nests are located within one mile of lakes, reservoirs, large rivers, and coast estuaries (Anthony and Issacs 1988). Nest trees are larger, dominant or codominant trees in the stand and are usually components of old growth or old-aged second growth forests (Anthony and Isaacs 1988). This research indicates bald eagles use trees for nesting that are larger and older than those produced under 80- to 100-year timber rotation systems. Nest trees usually have an open view of the area, a clear flight path to and from the tree, and suitable perch trees nearby.

Communal night roost trees in the mixed-conifer and Douglas-fir types are larger than those in the surrounding forest (Anthony et al. 1982). In specific studies, a more favorable micro-climate in communal roost areas than in adjacent forest stands existed, thereby aiding in energy conservation by the birds (Stalmaster 1981 and Keister 1981).

Bald eagles feed primarily on fish during the spring and summer but may shift to waterfowl and carrion during the winter.

Northern Spotted Owl

The northern spotted owl is federal listed as a threatened species and critical habitat has been designated under the Endangered Species Act (ESA). A recovery team has been established, and a recovery plan is being prepared.

Approximately two-thirds of the planning area has been inventoried for northern spotted owls. The inventory level varies. A total of 378 northern spotted owl sites have been identified in the planning area; 268 were occupied in 1992 (see Map 3-9). Owls have been captured and leg banded since 1986. Through 1992, approximately 986 owls have been banded, including 413 juveniles and 573 adults and subadults. In 1992, 76 percent of the known adult owls had been banded.

Research and monitoring of northern spotted owls in California, Oregon, and Washington indicate the northern spotted owl is primarily associated with old growth and mature forest types (Thomas et al. 1990; Thomas et al. 1993).

Northern spotted owls commonly nest in cavities, 50 or more feet above the ground in large, decadent old growth trees (Forsman et al. 1984; Gutierrez 1985). Other nest sites include large mistletoe clumps and platforms formed by whorls of large branches. In southwestern Oregon, it appears platform nests are more common than further north.

Northern spotted owls seldom forage in clearcuts or second-growth stands younger than 60 years of age; they prefer old growth (Forsman et al. 1984, 1987; Solis 1983). Abundance of prey and habitat with structural features favorable for foraging are important factors in preference for old growth (Carey et al. 1986a, 1986b; Forsman et al. 1984; Raphael and Barrett 1984; and Raphael et al. 1986). Northern spotted owl habitat must be capable of supporting the bushy-tailed woodrat, red tree vole, flying squirrel, snowshoe hare, deer mouse, and western red-backed vole.

The northern spotted owl's preference for mature and old growth forest for roosting (Forsman 1980; Marcot and Gardetto 1980) may be a response to the owl's need for thermoregulation (Barrows 1981). Avoiding great horned owls, a major predator of northern spotted owls, also may be an important factor. In the planning area, northern spotted owls often roost during the day in hardwood stands and late seral stage stands, generally in close proximity to old growth stands. Northern spotted owl selection of old growth habitat components in younger forests indicate habitat structure, rather than age, may be an essential factor (Forsman 1976, 1986; Forsman et al. 1977, 1984; Garcia 1979; Meslow et al. 1986; and Postovit 1977). Even with these old growth components, northern spotted owl densities in young growth are lower than in old growth (Forsman 1976, 1986; Forsman et al. 1977, 1984; Garcia 1979; Meslow et al. 1986; Postovit 1977; Vincent 1986).

Published home range sizes of individual northern spotted owls vary from 600 acres to more than 19,000 acres (Allen and Brewer 1985; Allen et al. 1987; Brewer 1985; Forsman 1986, 1987; Forsman et al. 1984; Forsman and Meslow 1985; Meslow et al. 1986; Reid et al. 1987; Sisco and Gutierrez 1984; Solis 1983). Little is known about factors that influence home range selection and size, although habitat fragmentation and structure probably play a major role (Carey 1985; Dawson et al. 1986; Forsman et al. 1984; Forsman and Meslow 1986; Gutierrez 1985). It appears northern spotted owls in Washington and northern Oregon generally have larger home ranges than in southern Oregon and northern California.

Marbled Murrelet

The marbled murrelet, a pigeon-sized seabird that nests in the forests of the Pacific Northwest, is listed as a federally threatened species in California, Oregon, and Washington.

The marbled murrelet is found along the west coast from central California north to the Aleutian Islands. Murrelets in the Pacific Northwest have been detected inland more than 35 miles from the ocean.

In Oregon, the marbled murrelet occurs along the entire coast but is most common between Coos Bay and Yaquina Bay and the adjoining inland areas (Marshall 1992).

From British Columbia to California, the marbled murrelet nests in old growth forests or mature forests with old growth characteristics including broken tops and deformed branches. Nests are found in large moss or debris covered sheltered branches that provide protection against rain, wind, and detection by predators. The murrelet nests in aggregations and uses forests every month of the year. The reasons for winter use are unknown. The size of nesting aggregations is related to stand size, the larger stands having more birds (Marshall 1992). There are more than 10 known nest sites in Oregon (Nelson, Personal Communication).

Surveys for the marbled murrelet in the Medford District began in 1993 to detect use on proposed timber sales in the Grants Pass resource area. No murrelets have been detected.

To quantify the amount of potential marbled murrelet habitat within the district, habitat was estimated using forest stand descriptions in Micro*Storms for stand age and stocking levels. Generally, potential murrelet habitat was described as stands older than 150 years of age, or stands with an overstory of at least 120 years of age with a well-stocked understory at least 80 years old. These stands would most likely have trees with the characteristics described above for known nesting sites in the Pacific Northwest. Stands that met these criteria and were within 50 miles of the coast were considered murrelet habitat.

Because habitat closer to the ocean has been described as more important for the murrelet, habitat was analyzed by distribution in four zones described in miles from the ocean: 0-12, 13-25, 26-35 and 36-50.

The Medford District currently has approximately 122,575 acres of marbled murrelet habitat, which is about 16 percent of the total forest acres in the district. Most (74 percent) of the district's habitat is located 36-50 miles from the coast, 26 percent is 26-35 miles, and only 138 acres (0.1 percent) is 13-25 miles inland. However, these numbers probably overestimate the true availability of murrelet habitat, especially in the southern portion of the district, in the vicinity of the Illinois valley. The stands identified here as suitable murrelet habitat occur in the mixed conifer/mixed evergreen vegetation type and the climate is characterized by hot, dry summers, largely due to a major north-south ridge between this area and the coast.

Fairly extensive surveys conducted by the Siskiyou National Forest (1988-1993) resulted in only three detections east of this ridge but they were not within the mixed conifer/mixed evergreen vegetation type (Dillingham et al 1993). North of the Rogue/Umpqua divide, the farthest inland murrelets found was 27 miles; south of the divide, the farthest inland was 17 miles. The closest detection to the Medford District was 5 miles from BLM land, which occurred in the Coquille River drainage. The Forest Service biologists suggest that murrelet use of the tanoak series may be limited by the vegetation type, hot summers, topography and other factors. If true, the suitability of virtually all the identified murrelet habitat in the Medford District is questionable. And perhaps south of the Rogue/Umpqua divide the district would not contain any truly suitable habitat.

Gray Wolf

The gray wolf is listed as an endangered species and believed to be extinct in Oregon. There have been no inventories for this species. In recent years, purported sightings in the planning area have created controversy as to whether gray wolves actually do exist in southern Oregon. Biologists have been unable to determine whether the sightings were gray wolves, dogs, coyotes, or wolf-dog crosses. The issue is confused further because domestic wolves may have been illegally released at maturity into the wild.

Peregrine Falcon

The peregrine falcon is federal listed as an endangered species. A Pacific Coast Recovery Plan has been prepared and is currently being implemented (USFWS 1982).

There are two confirmed active peregrine sites in the planning area. Occasional sightings of peregrines are made during the winter months; these are thought to be migrant birds.

The peregrine falcon is a cliff-nesting species that prefers tall cliffs with ledges located near water, potholes, or small caves suitable for constructing a nest scrape (USFWS 1982). Areas frequented by shorebirds, pigeons, and waterfowl provide ideal feeding areas.

Nest site disturbance and pesticide-related eggshell thinning are the major problems in reproductive success.

Del Norte Salamander

The Del Norte salamander is considered a candidate species for listing as a federal threatened or endangered species by the USFWS. It is most often found in moist talus or other rock and moss-covered rubble (Stebbins 1966). There is a correlation between this species' abundance and a hardwood understory (Raphael 1988). This species may be strongly affected by removal of old growth Douglas-fir habitat. There has been no systematic inventory for this species, however, it has been documented within the planning area. Recent surveys have extended the range of this species north into Douglas County.

Northern Goshawk

The northern goshawk is considered a federal candidate for listing as a threatened or endangered species. Currently the USFWS is conducting a status review to determine if listing is appropriate. The primary threat to this species is loss of habitat due to timber harvest.

Goshawks are the largest of the three accipiter hawks found in North America. Their habitat consists of a variety of forest conditions, but preferred habitat within the planning area is older mature or old growth conifer forests (Marshall 1992; Reynolds 1983). Goshawks forage below the canopy and feed on grouse, squirrels, woodpeckers and a variety of other species of birds and mammals.

They build large stick nests in large diameter Ponderosa pine, Douglas-fir, Madrone or other species and often return to the same stands year after year.

Conservation and management guidelines have recently been proposed for goshawks in the southwestern U.S. (Reynolds et al. 1991), along with draft interim direction for U.S. Forest Service lands in Oregon and Washington. These guidelines call for protecting active nest areas (about 30 acres) and establishing a post fledgling family area (about 390 acres is proposed for Forest Service lands in Oregon) to provide habitat for fledgling birds.

Goshawk sightings within the planning area have been recorded for years but few systematic inventories have been conducted. Few nest trees have been located.

Northwestern Pond Turtle

The Northwestern pond turtle, a subspecies of the western pond turtle, is a candidate for listing as a federal threatened or endangered species. It is currently undergoing a status review by the USFWS to determine if listing is appropriate.

This species is one of two native species of turtles found in the Pacific Northwest, and the only native turtle found in southern Oregon. It is an aquatic habitat generalist utilizing rivers, lakes, streams, ponds, ephemeral and permanent wetlands, and distributed habitats (log ponds, sewage ponds, etc.).

Females nest up to 402 meters from their aquatic habitat (Holland 1991), and often make several overland forays before actually laying eggs (Goodman 1993; Reese 1993). Females excavate a light bulb shaped nest in compact soils from possibly as early as mid-May (in Oregon) to mid-July. Young of the year overwinter in their nest. Nesting areas generally have a south or southwest aspect (though some east or southeast nests have been found) and are dominated by short grass or shrubs with moderately to heavily compacted soil which contain a significant clay or silt fraction.

Turtles begin overwintering in late October through November by dispersing to upland sites and burying themselves in leaf litter. Recent studies indicate some pond turtles will overwinter in undercut areas along the banks of ponds (Todd 1993). In some areas, turtles may be active year-round in the watercourse with activity level increasing in the spring. Upland sites are used during the summer and fall as well and are located on all aspects. Longevity has been estimated at 40+ years (Bury and Holland 1993).

Adults are omnivorous with the majority of their diet consisting of aquatic invertebrates supplemented with vegetation and carrion. In contrast to adults, juvenile northwestern pond turtles are habitat and dietary specialists, preferring shallow, thickly vegetated aquatic area with the main food source being aquatic invertebrates.

Recent studies conducted by Holland (1993) indicate populations have been reduced by 90 percent throughout its range, with the Rogue River basin showing a moderate to severe decline. Specifically, of the 54 historical populations recently surveyed in the Rogue River basin, only 8.5 percent contained turtles (Bury and Holland 1993). A number of factors are probably responsible for the decline in populations. Droughts and habitat alteration have reduced the quantity and quality of aquatic habitat. Introduced exotic predators, such as large mouth bass and bullfrogs have had a serious impact on juvenile turtles. Vehicle traffic on roads and overcollecting has increased the mortality rates on all ages. Grazing, timber harvest and other activities in upland habitats has directly killed turtles and adversely affected nesting and overwinter habitat.

Currently, most populations of Northwestern pond turtles are suffering from lack of recruitment. Population studies by Holland (1993) show that many populations in Oregon are composed of 90+ percent adults. This unnatural age ratio, along with a decline in the number of occupied sites, has led many to believe that the Northwestern pond turtle is rapidly becoming extirpated from its once extensive range.

Siskiyou Salamander

The Siskiyou salamander is considered a candidate species for listing as a federal threatened or endangered species by the USFWS. The species is limited to the Applegate River drainage and is found in isolated pockets of talus slopes where there is sufficient moisture and space between the rocks (Nussbaum 1974). This is the only portion of the planning area where this species has been documented. No inventory has been conducted.

Townsend's Big-eared Bat

The Townsend's big-eared bat is a candidate species for listing as a federal threatened or endangered species.

Inventories for the big-eared bat within the planning area estimate a population level of about 400 individuals (Perkins 1990). Known locations of the bat on BLM-administered land in the district have been recorded. Three nursery colonies in southwestern Oregon have been reported during surveys of Curry, Josephine, and Jackson counties (Cross 1977).

Caves and cave-like structures are important habitat for the big-eared bat, both as winter hibernating sites and as roosts for summer nursery colonies (Perkins 1987). The species also will use abandoned mine tunnels and buildings. Other important habitat features include wet meadows, estuaries, and riparian areas.

Fringed Myotis

The fringed myotis is a small bat and is considered a sensitive species by BLM. Little is known of the habitat needs of this species. They have been captured foraging in openings and in mid-seral stage habitats (Maser et al. 1981), it appears they may require cliffs and caves or old growth forests for roosting (Brown 1985).

Cascades Frog

The Cascades frog is considered an assessment species by BLM in Oregon. They are located relatively high in the mountains, always in close proximity to open water (Stebbins 1966). There has been no inventory for this species.

Red-Legged Frog and Spotted Frog

Both the red-legged frog and spotted frog are federal candidates for listing as a threatened or endangered species.

These species inhabit marshes, ponds, and slow moving streams. The red-legged frog is generally confined to low elevations and has been found up to 1,000 feet from water during the nonbreeding season when conditions are wet. The spotted frog has been found at both low and higher elevations.

Once found throughout western Oregon, populations of these species have declined substantially and they have been extirpated from portions of their ranges (Marshall 1992). Reasons for the decline are unknown but possible causes include the introduction of bullfrogs and other predators into western Oregon, the use of herbicides and pesticides, and the loss of wetland habitat.
There has been no inventory for these species within the planning area and their status is uncertain.

Tailed Frog

The tailed frog is considered an assessment species by BLM in Oregon. They are associated with clear, cold streams in cool, older forest stands (Stebbins 1966). There has been no inventory for this species.

Clouded Salamander

The clouded salamander is considered an assessment species by BLM in Oregon. They are found under the loose bark of snags or down logs. In the summer they often congregate deep inside large decayed logs. There are correlations between clouded salamander abundance and large conifers as well as down woody material. This species may decline as a result of the harvest of old growth habitat (Raphael 1988). There has been no inventory for this species, but it has been documented within the planning area (St. John 1984).

Jenny Creek Sucker

The Jenny Creek sucker, a dwarf form of the Klamath small scale sucker, is limited in distribution to the Jenny Creek subbasin of the Klamath River in the southeastern portion of the planning area (Hohler 1981). The USFWS classifies it as a candidate for possible listing as a threatened and endangered species (USDI 1989). This is the only known dwarf sucker in the Pacific Northwest and possibly the only true dwarf representative of the larger species west of the Rocky Mountains. The Jenny Creek population of the Klamath small scale sucker may be described as a separate subspecies. ODFW has classified the species as "sensitive" in recognition of its restricted distribution and high susceptibility to adverse environmental change (ODFW 1990).

The species inhabits about 29 miles of Jenny Creek and its tributaries, 8 miles of which pass through BLM-administered lands. BLM administers approximately 43 percent of the Jenny Creek watershed.

Although the Jenny Creek sucker utilizes all habitat types, it prefers low gradient, partially shaded stream segments with relatively silt-free cobble/rubble substrate. Diverse, structurally complex riparian habitat is as important to this species as it is for the stream's rainbow trout population.

Effective hiding cover such as large woody debris and undercut streambanks and high water quality are required for rearing, spawning, and food production. Aquatic insects such as water penny, stonefly, mayfly, and caddisfly, which occur primarily in clean riffle habitat, comprise a major portion of the sucker's diet.

Redband Trout

Redband trout inhabit Jenny Creek, a tributary of the Klamath River, and at least two of its tributaries, Beaver and Johnson creeks. The full extent of the distribution is unknown. Redband trout, which have evolved unique adaptations to survive in harsh, fluctuating, arid environments, are apparently on the periphery of their range in Jenny Creek. The redband group of rainbow trout, which inhabits arid regions of Oregon, southwestern Idaho, Nevada, and northern California, is classified as a Category 2 candidate species under the ESA and is listed by the State of Oregon as sensitive. The genetic integrity of redband trout in Jenny Creek is relatively good (Currens 1990). Livestock grazing, water diversions, timber harvest, and sedimentation have degraded habitat in Jenny Creek.

Although physical habitat requirements of the species in Jenny Creek are poorly understood, they probably are similar to resident rainbow trout. Adults use pea-sized gravel in riffle areas for spawning. For good survival, spawning gravels must be relatively free of fine sediment so water with sufficient oxygen can pass to developing embryos. Juveniles utilize channel margins for rearing and, as they become larger, move into pools with good hiding cover (e.g., undercut banks, large woody debris, overhanging vegetation) and behind rocks in riffle areas. Casual observation of trout distribution in Jenny Creek suggests they undergo major seasonal shifts in distribution, apparently in response to changing stream flow and water temperatures.

Chinook Salmon

Chinook salmon are anadromous fish, reproducing in fresh water and spending most of their juvenile and adult life in the Pacific Ocean. The species utilizes moderate to large, low-gradient streams for spawning (e.g., mainstem and both forks of the Illinois River and Sucker, Althouse, and Deer creeks in the Illinois River basin). Adults usually concentrate on gravels 2 to 6 inches in diameter and relatively free of sediment so water with sufficient oxygen can pass to developing embryos and carry away metabolic wastes. Once fry emerge, they begin downstream movement to the ocean. Most Rogue River basin chinook juveniles enter the ocean at less than one year old. In the Rogue River basin, chinook spawn in the main stem of the Rogue up to Cole River hatchery as well as in major tributaries.

Age at maturity depends on racial characteristics. Rogue River basin chinook tend to spawn when they are 2 to 5 years of age. Males usually return after fewer years at sea than females. Suitable spawning habitat and adequate flow and temperature during egg incubation appear to be the most important factors affecting production of wild stocks. In addition, production is correlated with the effects of winter storm runoff on egg survival.

The population of fall chinook salmon originating from the Illinois River basis in depressed (Nickelson et al. 1992), compared to historic levels.

Coho Salmon

Populations of coho salmon from the entire Rogue and South Umpqua river basins are depressed, compared to historic levels (Nickelson et al. 1992).

Coho salmon are anadromous fish, reproducing in fresh water and spending their adult life in the Pacific Ocean. Coho salmon throughout the Rogue River basin are listed by the State of Oregon as sensitive. Historically, coho salmon used tributaries upstream and downstream from the Rogue River canyon for spawning and rearing habitat, including the Illinois and Applegate river basins.

Adults migrate upstream during fall to spawn in small to moderate size, low-gradient streams. Suitable spawning habitat consists of one-half to three inch diameter gravel in riffle areas relatively free of sediment capable of passing well-oxygenated water to deposited eggs.

Survival and growth of juveniles during their 16 months of fresh water residence depend on the vegetative structure of adjacent riparian habitat, stream flow, and water temperature. By late summer when stream flow is at a minimum, pools at least two feet deep associated with woody debris, undercut banks, and overhanging vegetation are preferred. Juveniles require water temperatures less than 60°F for optimal growth and survival. Young coho winter in backwater areas or along undercut banks with abundant woody debris as cover. Large wood, originating from the adjacent riparian area, is a major factor in creating deep pool habitat. Lack of cover and deep pool habitat in streams may result in an early migration and subsequent low survival rate. Surviving juveniles migrate to the ocean as smolts during the spring. Most coho spend approximately 18 months in the ocean before returning to spawn as 3-year adults averaging 8 to 10 pounds in weight.

Winter and Summer Steelhead

The American Fisheries Society and Endangered Species Committee consider winter steelhead trout in the Illinois River basin and Rogue River summer steelhead to be threatened with extinction (Nehlsen et al. 1990). However, the State of Oregon considers these stocks to be species of concern (ODFW 1990). BLM considers winter steelhead trout in the Illinois River Basin as an assessment species.

Water withdrawal for irrigation, urban development, logging practices, and road construction have cumulatively reduced stream productivity by altering habitat, increasing sedimentation, reducing the available water supply, and elevating water temperatures.

Unique genetic resources may be present among populations of steelhead in the planning area, since there are significant differences in life history patterns between races of steelhead produced in the various subbasins of the Rogue River (Satterthwaite 1989). The Rogue is one of three North American rivers that supports an annual migration of "half pounder" summer steelhead (Everest 1973). A large proportion of Rogue River winter steelhead also make a half-pounder migration.

Spawning summer steelhead are restricted to smaller tributaries of the Rogue and Applegate river basins. Many summer steelhead streams are small, with watershed areas less than 25 square miles, and become intermittent or dry during summer, some as early as mid-May. Summer steelhead spawn in approximately 100 streams in the Rogue and Applegate river subbasins. Historically, six have been the most productive: Antelope, Galls, Kane, Foots, Sams, and Sardine creeks. Virtually all lands bordering these streams are privately owned; BLM-administered land in each of these subbasins is less than 50 percent.

In contrast to summer steelhead, adult winter steelhead spawn and rear in both the mainstream and tributaries of the Rogue, Applegate, and Illinois rivers and Cow Creek. Winter steelhead generally use larger tributaries than summer steelhead in subbasins common to both. Considerable overlap exists.

Adult steelhead use small- to medium-size gravel riffles in tributaries and areas around islands or side channels for spawning. For good survival, spawning gravels must be relatively free of fine sediments so water with sufficient oxygen can pass to developing embryos.

Once fry emerge from the gravel they seek shallow, relatively calm areas along the channel margin until they become larger. Fry can remain near the spawning site or drift downstream to larger tributaries depending on fry density, habitat productivity, stream flow, or high water temperature. Juveniles require water temperatures less than 60°F for optimum growth and survival. Young steelhead exhibit more seasonal movement into and out of tributary streams than coho or chinook salmon. Therefore, it is important in maintaining wild steelhead populations to have fourth order and higher streams, as well as nonfishery streams in headwater areas, in good condition and free of human-created passage barriers.

Marten

The marten is considered an assessment species by BLM in Oregon. They are a fur-bearer in the weasel family. They are associated with dense, mature, and old growth forests, often using down logs for hunting and resting. Marten feed on small mammals, birds, fruits, and insects. Home range size varies, with males ranging from almost one to more than ten square miles and three-tenths to more than six square miles for females (Irwin 1977). There have been no inventories for this species.

Fisher

The fisher is considered an assessment species by BLM in Oregon. They are larger than the marten and are found in mature and old growth conifer forests. Virtually extinct in southwestern Oregon, they have slowly begun to reappear due to reintroduction and protection from trapping. There have been no inventories for this species.

Lewis' Woodpecker

This species is considered an assessment species by BLM in Oregon. Lewis' woodpeckers live in dryland hardwood oak stands and other hardwood with scattered pines. Often these stands are interspersed with grassland or shrub communities. The Lewis' woodpecker is unique in foraging on flying insects. Populations have declined for several years; however, there are some indications their numbers may be recovering. No inventory has been conducted.

Pileated Woodpecker

This species is considered an assessment species by BLM in Oregon. This is a large woodpecker and is associated with mature and old growth forest. They require large trees, approximately 25 to 30 inches in diameter, for excavating a nest cavity (Bull 1975; Mannan 1977; Bull 1980). Pileated woodpeckers rarely use snags in clearcuts or other openings (Schreiber 1987). Home range size varies from 320 to 600 acres (Bull and Meslow 1977) to more than 1,000 acres (Mannan 1984). The FS has begun inventories for pileated woodpeckers in southwestern Oregon. No inventory has been conducted by BLM.

Western Bluebird

The western bluebird is considered an assessment species by BLM in Oregon. They nest in open habitats, using cavities excavated by other species. They feed on berries, fruits, and insects. Populations have declined over the years. Loss of habitat and competition from starlings and house sparrows are cited as reasons for a decline.

Mountain Quail

The mountain quail is a federal candidate for listing as a threatened or endangered species, largely because of declining populations east of the Cascades. They are also classified as a game species in Oregon.

In western Oregon mountain quail appear to be common forest birds above the interior valleys. Population trends are monitored by ODFW annually. Populations fluctuate yearly due to weather and other conditions but they are generally stable. These birds use a variety of habitats, including open meadows and shrub fields, clearcuts and other openings, and forested stands.

Special Areas

Special areas are identified for management through land use plan allocations and designations. Special areas consist of:

- areas of critical environmental concern (ACEC),
- research natural areas (RNA),
- outstanding natural areas (ONA), and
- other land use plan allocations such as environmental education areas (EEA).

ACECs have been designated under the authority of the Federal Land Policy and Management Act of 1976 to protect important historic, cultural, scenic values, natural resources and natural systems or processes. Natural hazard areas can also be identified under an ACEC designation. An RNA is an ACEC that contains natural resource values of scientific interest and is managed primarily for research and educational purposes. An ONA is an ACEC that contains unusual natural characteristics and is managed primarily for educational and recreational purposes. An EEA is identified for educational purposes.

During the initial stages of the 1990s RMP process, the public, BLM employees, and other government agencies identified new areas within the district with resource values that appeared to meet ACEC criteria (see Identification & Screening of Candidate ACECs, Appendix 3-SA-3). All existing and potential special areas were then reviewed by an interdisciplinary team to determine whether the areas met the ACEC criteria of relevance and importance (see Glossary). During this review, recommendations were made to alter boundaries of some of the proposed or designated special areas to better protect or identify the primary values of the area(s). The decision to designate any or all of the potential ACECs is part of the RMP process.

The district currently manages 8 special areas including 3 ACECs, totalling 2,577 acres; 2 RNAs, totalling 670 acres; and 3 environmental education areas, totalling 30 acres (see Table 3-SA-1 and Map 3-10). One ACEC is also an ONA.

Table 3-SA-1. Existing Special Areas

Site Name	Size (Acres)	Primary Description	Resource Value
Brewer Spruce RNA	390	Fills RNA terrestrial cell of Brewer Spruce forest for the Siskiyous and aquatic cell of mid- to high-elevation permanent pond.	Natural area to serve as baseline/ research, special status species, natural systems.
Woodcock Bog RNA	280	Fills RNA aquatic cell of Darlingtonia wetland on serpentine-peridotite in western Siskiyous.	Botanical/special status species, natural area to serve as baseline/ research, natural systems.
Eight Dollar Mountain ACEC	1,247	Habitat for largest concentration of special status species in state.	Botanical/special status species, natural systems.
King Mountain Rock Garden ACEC	90	High elevation serpentine community with special status plants.	Botanical/special status species.
Table Rocks	1,240	Vernal pool-patterned ground. Only site in the world for dwarf meadow-foam, a federal candidate species. Unique geological feature.	Botanical, geological, special status species, natural systems.
Hollenbeck Environmental Area	20	Environmental education area.	Education, special status species.
Listening Tree Environmental Area	5	Environmental education area with trail.	Education.
Hidden Creek Environmental Area	5	Environmental education area with trail.	Education.

All existing ACECs and RNAs areas were reviewed to determine whether they continue to meet relevance and importance criteria for ACEC designation. All were found to meet the criteria (see Appendix 3-SA-1, Draft RMP).

During the RMP process, 37 new candidate ACECs were identified and screened for eligibility for further consideration in this RMP (see Appendix 3-SA-3, Draft RMP). As a result of this process, 34 of these areas are being considered for ACEC designation and management (see Table 3-SA-2 and Map 3-10). Two areas did not meet the relevance or importance criteria.

Table 3-SA-2. Potential Special Areas

Site Name	Size (Acres)	Primary Description	Resource Value
ACEC			
Bill Creek	40	Old growth community provides habitat for wildlife including northern spotted owl and goshawk. Area of uninfected Port-orford-cedar.	Natural systems, wildlife special status species.
Bobby Creek	2,130	Largest contiguous unentered watershed and block of old growth forest still present in the planning area. Douglas-fir/tanoak forest interspersed with hardwood stands. Third order stream with cutthroat trout. Habitat for the listed northern spotted owl and the goshawk, a federal candidate. May meet RNA cell.	Natural systems, botanical, special status species, in wildlife, fisheries.
Cedars of Beaver Creek	39	Isolated island of old growth with ecological processes of diverse species and age-classes containing wildlife.	Natural systems, botanical, wildlife.
Crooks Creek	100	Old growth forest provides habitat for wildlife including two salamander species, bats and northern spotted owls.	Natural systems, wildlife, special status species.
Dakubetede	5,420	Native plant communities of area support habitat for diverse wildlife including northern spotted owls and the Siskiyou salamander as well as unique plant species. Watershed provides habitat for salmon and steelhead trout. Historic mining ditch now uses as a trail provides scenic views.	Natural systems, wildlife, scenic, botanical, historical
Enchanted Forest	79	Old growth forest community provides habitat for wildlife including the northern spotted owl and two species of special status species.	Natural systems, wildlife, special status species
Flounce Rock	550	Scenic rock escarpment with the northern-most location of Baker cypress.	Botanical, scenic historic/cultural, wildlife.

Table 3-SA-2. Potential Special Areas (continued)

Site Name	Size (Acres)	Primary Description	Resource Value
ACEC			
French Flat	792	Area supports several unique types valley bottom plant communities and five special status plants. Also provides habitat for several mammals, waterfowl, and possibly northern spotted owls.	Botanical, special status species, natural systems.
Hole-in-the-Rock	160	Natural arch of more than 35' in height provides scenic and geological values.	Geological, scenic.
Hoxie Creek	185	Old growth ecosystem provides wildlife habitat. Wet meadow provides habitat for waterfowl and other wildlife and is also the site of an active osprey nest.	Natural systems, wildlife, botanical.
Iron Creek	520	Old growth forest provides wildlife habitat, including northern spotted owls.	Natural systems, wildlife, botanical, special status species.
Jenny Creek	705	Stream system in canyon environment. Provides habitat for the Jenny Creek sucker and redband trout, federal candidates.	Wildlife, natural systems, special status species
Larkspur	2,440	Large old growth forest stand which provides fish and wildlife habitat, including northern spotted owls. Area of uninfected Port-orford-cedar.	Natural systems, wildlife, botanical, special status species.
Little Hyatt	296	Old growth ecosystem provided habitat for wildlife and is the site of northern spotted owl, elk and deer winter/spring range. Recreational values of Pacific Crest Trail.	Natural systems, wildlife, special status species
Moon Prairie	79	Isolated island of old growth forest surrounded by massive forest removal. Large pacific yew stand. Wildlife values for thermal and hiding cover.	Natural systems, botanical, wildlife.
Pacific Crest Trail	12,086	28 miles of national scenic trail system passing through coniferous forests with scenic vistas.	Scenic.

Table 3-SA-2. Potential Special Areas (continued)

Site Name	Size (Acres)	Primary Description	Resource Value
ACEC			
Pilot Rock	270	Prominent volcanic plug in Siskiyou Pass area with adjoining fossil bed and wildflower meadows used for educational studies. Habitat for 3 special status bat species. Landmark used for navigation on the Oregon/ California trail.	Geological, botanical, wildlife, special status species, historical.
Poverty Flat	40	Vernal pool wetlands with oak-grass savannah and chaparral communities. Site of two federal candidate species.	Botanical, special status species, natural systems.
Rock Creek	160	Old growth forest and creek provide fish and wildlife habitat, including northern spotted owls and bats.	Natural systems, wildlife, special status species
Rogue River	68,644	Scenic river corridor provides a route for wildlife migration. Also provides recreational use.	Scenic, wildlife, botanical, natural systems.
Siskiyou Mountain Natural Area	20,000	Convergent point of 3 different physiographic regions and 4 different climatic zones including an area of diverse and unique plant communities. Habitat for 3 federal candidate plant species and several other sensitive plants. Habitat for fish and wildlife including the Jenny Creek sucker, elk and deer, and northern spotted owls.	Natural systems, botanical, wildlife, historic, special status species.
Sterling Mine Ditch	167	23 miles of a historic ditch constructed in 1877 used for hydraulic mining, now used as a recreation trail. Played a significant role in the settlement and economy of the American west.	Historical, botanical.
Tin Cup	68	Last remnant of unlogged true fir forest. Unique advancing forest edge on frost plateau. Outstanding education value. Value for owls, deer, and elk. Island adjacent to prairie.	Natural systems, botanical, wildlife.

Table 3-SA-2. Potential Special Areas (continued)

Site Name	Size (Acres)	Primary Description	Resource Value
ACEC			
Williams Watershed	13,950	The old growth communities and streams of the watershed provide habitat for several fish species, two species of salamander, one special status plant, plus 26 species of old growth dependent plants, and habitat for several mammals and birds including northern spotted owls and peregrine falcons. Granitic soils could result in natural hazards.	Natural system, wildlife, botanical, natural hazard, special status species.
RNA			
Brewer Spruce Enlargement	1,384	The area occupies a rugged ridgetop in a high-elevation mixed conifer community with associated brushfields. Approximately 60 percent of the area is forested, the remaining area is brush fields and bare rock.	Natural area to serve as a baseline/ research, botanical, natural wildlife, natural systems.
Grayback Glades	1,069	Fills 2 RNA cells for terrestrial white fir/Port-orford-cedar and aquatic first order stream in eastern Siskiyous.	Natural area to serve as a baseline/ research botanical, natural systems.
Holten Creek	846	Old growth forest community. RNA cell for Douglas-fir, white fir in the eastern Siskiyous. The intact watershed provides excellent wildlife habitat.	Natural area to serve as baseline/ research, botanical, natural systems.
Lost Lake	400	Fills RNA cell for natural low elevation lake in southern Cascades surrounded by mixed conifer forest.	Natural area to serve as baseline/ research, natural systems.
North Fork Silver Creek	600	Fills RNA terrestrial cell of white fir forest and aquatic cell, first to third order stream on metamorphic rock.	Natural area to serve as baseline/ research, botanical, natural systems.

Table 3-SA-2. Potential Special Areas (continued)

Site Name	Size (Acres)	Primary Description	Resource Value
RNA			
Old Baldy	160	Fills RNA cell for white fir high elevation with shasta red fir/mountain hemlock/Pacific silver, fir/white pine and southern Oregon Cascades chaparral communities. Provides habitat for northern spotted owls. chaparral communities.	Natural area to serve as baseline/ research, natural systems, botanical, special status species, wildlife.
Oregon Gulch	1,066	Fills RNA cell of mixed conifer forest in Rogue Valley and cell of manzanita-wedgeleaf ceanothus/bunchgrass in Rogue Valley.	Natural area to serve as baseline/ research, botanical, natural systems.
Pipe Fork	518	Fills two RNA cells for terrestrial ecosystems in the Siskiyou mountains. Port-orford-cedar/Oregon grape community and Port-orford-cedar/ salal community.	Natural area to serve as baseline/ research, botanical, natural systems.
Round Top	600	Fills 3 RNA cells: oak/grass savannah, oak-ponderosa pine woodland, and typical grassland mosaic in the Rogue Valley. Site of one federal candidate plant species.	Natural area to serve as baseline/ research, botanical, special status species, natural systems.
Scotch Creek	1,781	Fills RNA cell for typical chaparral community in eastern Siskiyous.	Natural area to serve as baseline/ research, natural systems.

Cultural Resources

Human occupation of the planning area is known to have begun at least 9,000 years ago and is represented by numerous sites on both BLM-administered and private land. There are many prehistoric occupation sites inventoried in the planning area (see Appendix 3-C-1, Draft RMP). These range from deep, well-stratified sites along the Rogue River to small flake scatters in the upland areas. Several sites have been excavated and reported. Several other sites have been subjected to less extensive testing.

Prehistoric sites are found at all elevations and in a variety of ecological settings within the planning area. American Indian habitation focused along the fish-rich rivers and their tributaries, with winter villages located along these streams. One such site spans the last 7,000 years and is the oldest dated prehistoric site in southwestern Oregon. Higher elevation hills and mountains were used on a seasonal basis, and prehistoric remains in these areas consist of seasonal encampments and task-specific sites. Ritual activity is represented on the district by several rock cairns and other rock structure sites, probably associated with aboriginal spiritual quests.

There are no areas within the planning area that are known to be currently important as American Indian religious sites or traditional use areas.

Historical records of the area begin with the journals of trappers who came to the region in the 1820s.

Settlement began in 1851 with the discovery of gold near what is now the settlement of Galice. The arrival of miners and settlers to the region engendered a series of conflicts with the Native inhabitants, known as the Rogue Indian Wars. As part of these bloody wars, many of the indians were confined to a local reservation in 1853. In 1856, most of the surviving natives were forcibly removed to reservations in northern Oregon.

While the early historic development of the region was based on gold mining, subsequent economic development involved forestry, agriculture, transportation, and recreation.

There are many recorded archaeological sites from the period of historic occupation on the district. Three of these sites are placed on the National Register of Historic Places: one is a historic ranch associated with the 7,000-year old prehistoric site; one is a historic cabin, and the third is a historic road. The remaining historic sites include cabins, cemeteries, mines and mining remains, a lookout, homesites, and old roads and trails.

The route of state Highway 66 coincides with the route of the Oregon-California Trail, locally referred to as the Applegate Trail. This was designated as part of the national trails system in 1991. Although located mostly on private land, the Applegate Trail crosses BLM-administered land in several locations.

Visual Resources

Visual resources are the land, water, vegetation, structures, wildlife, and cultural modifications that make up the scenery of BLM-administered land. BLM-administered land is classified according to the relative worth from a Visual Resource Management (VRM) point of view. There are four VRM inventory classes established by BLM manual. Criteria used to determine VRM classes are: scenery quality ratings, public sensitivity ratings, and distance zone-seen area mapping criteria. Management objectives to maintain, enhance, or preserve scenic values are described in Chapter 2.

Approximately 60 percent of the viewsheds in the planning area have fragmented land ownership patterns with private lands dominating the viewed landscape (see Table 3-VRM-1 and Map 3-11).

Wild and Scenic Rivers

BLM manages 47 miles of the Rogue National Wild and Scenic River in cooperation with the Siskiyou National Forest, the Oregon Scenic Waterways

Table 3-VRM-1. Visual Resource Inventory Management Classes

VRM Class	Approximate Acres	Percent BLM Ownership	Representative Areas
Class I	14,300	2.9	Rogue National Wild and Scenic River Corridor.
Class II	287,000	33.0	Seen area from Oregon Caves Highway Rogue National W&S River, Interstate 5 corridor, Hyatt/Howard Prairie reservoirs, Applegate River Valley, Pacific Crest Trail, Crater Lake Highway, Lake Selmac, Galesville Reservoir.
Class III	319,000	36.8	Seen area from Cow Creek Road, Galice Access Road, Oregon Caves Highway, Redwood Highway, Grants Pass, Merlin, Butte Falls-Prospect Highway.
Class IV	238,200	27.1	Seen area from Bobby Creek Road, Waldo Road, Hog Creek Access Road, Keno Access Road, Upper Grave Creek.

program, and the Oregon State Marine Board (see Table 3-WS-1 and Map 3-12).

BLM uses a three-step wild and scenic rivers study process: first, determine eligibility; second, determine potential classification (both were completed in early 1990); and third, determine suitability which is done through this planning process. Final decisions concerning designation of Wild and Scenic Rivers is reserved by Congress. Files used to document eligibility and potential classification are maintained in the Medford District Office.

The National Rivers Inventory (NRI) identified no river segments which cross or are within a quarter mile of BLM-administered land in the planning area which would require studying for potential W&SR designation. However, the BLM, public, state agencies, and others identified 92 segments of other such rivers which could have potential for national wild, scenic, or recreational river designation. To each of these river segments, BLM applied eligibility and classification criteria established in U.S. Department of the Interior-Department of Agriculture guidelines evaluating a corridor extending a quarter mile on each side of the segment (see Appendix 2-WSR-2, Draft RMP). The status of eligibility determinations for these rivers is shown in Table 3-WS-2.

Sixty-four river segments meet eligibility criteria for designation and thus would be eligible for suitability study based on their free-flowing character and outstandingly remarkable values (see Map 3-12). Forty-eight of these river segments are located in areas where BLM-administered land provides substantial control of the river segment and will be studied in the RMP process to determine their suitability for wild and scenic river designation (see Appendix J).

Recreation

The major recreation activities that occur on BLM-administered lands in the planning area are camping, picnicking, hiking, horseback riding, general sightseeing (driving for pleasure, scenery and wildlife viewing), hunting, fishing, white-water rafting, off-highway vehicle operation, snow-play, cross country skiing, and snowmobiling.

All BLM-administered lands fall into two recreation management categories: special recreation management areas (SRMAs), and extensive recreation management areas. Typically, SRMAs are high-use recreation areas with developed recreation facilities that require substantial recreation investment and/or management such as wilderness, wild and scenic rivers, and large areas with high recreation resource values (see Map 3-13). Extentive recreation management areas cover all other BLM-administered land within a resource area not included within an SRMA.

Table 3-WS-1. Designated Wild, Scenic, and Recreational Rivers

River Name	Total River Miles	BLM River Miles			Current BLM Management
		Wild	Scenic	Recreational	
Rogue River (Josephine & Curry counties)	84	20	0	0	1/4-mile on either side of the river (approximately 6,022 acres) protected from all surface-disturbing activities. Developed facilities: 26 miles of hiking trail, 22 camp units, and 1 boat access point. Commercial river use regulated by permit year-round. Private river use regulated by permit from June 1 through September 15.
Rogue River (Josephine County)		0	0	27	1/4 mile on either side of the river (approximately 8,245 acres) are protected from some surface-disturbing activities. Developed facilities: 30 miles of hiking/riding trail, 6 picnic units, and 4 boat access points, 168 scenic easements. Commercial river use regulated by permit year round.

Table 3-WS-2. NRI-Listed and Other Potential Rivers

River Name	Eligibility[1]	Highest Potential Classification[2]	Outstandingly Remarkable Values[3]	Total River Miles	Percent BLM[4]
Ashland Resource Area					
Antelope Creek	E	R	F	17.5	6
Applegate River	E	R	F	46.3	1
Camp Creek	NE			11.0	65
Carberry Creek	NE			6.5	2
Dead Indian Creek	NE			9.5	18
Deer Creek	NE			3.0	50
Dutch Oven Creek	NE			3.8	100
Left Fork Foots Creek	E	R	F	1.5	7
Jenny Creek	E	S	F, H	17.6	39
Little Applegate River	E	R	F	10.0	19
Lost Creek (segment 1)	NE			2.0	95
Lost Creek (segment 2)	E	W	S	.9	93
Ninemile Creek	E	R	F	1.6	61
Rogue River (segment 1)	E	R	R, F	12.5	1
Rogue River (segment 2)	E	R	R, F	18	3
Rogue River (segment 3)	E	R	R, F	32.5	3
Soda Creek	E	R	F	3.8	85
South Fork Little Butte Creek	E	R	F	16.3	7
Star Gulch Creek	E	R	F	8.1	91
Butte Falls Resource Area					
Beaver Dam Creek (Tributary to South Fork Rogue)	NE			7.8	13
Big Butte Creek (including the South Fork of Big Butte Creek)	E	R	F	21.1	11
North Fork Big Butte Creek	E	R	F	13.4	48
Elk Creek	NE			11.5	17
Evans Creek (main)	NE			18.4	6
Evans Creek (east fork)	NE			15.4	27
Evans Creek (west fork)	NE			14.6	51
Little Butte Creek (Butte Falls and Ashland RA)	NE			23.4	4
Pleasant Creek	NE			11.4	22
Rock Creek (Tributary to West Fork Evans Creek)	E	R	F	6.0	52

Table 3-WS-2. NRI-Listed and Other Potential Rivers (continued)

River Name	Eligibility[1]	Highest Potential Classification[2]	Outstandingly Remarkable Values[3]	Total River Miles	Percent BLM[4]
Salt Creek (Tributary to West Evans Creek)	NE			4.75	34
Sams Creek	E	R	F	5.5	6
South Fork Rogue River	NE			8.0	4
Trail Creek (main stem)	NE			3.6	2
Trail Creek (east fork)	NE			7.1	38
Trail Creek (west fork)	NE			7.0	12
Lost Creek (north)	NE			2.4	64
Lost Creek (south)	NE			3.6	17
Glendale Resource Area					
Alder Creek	E	W	S, R	1	100
Booze Creek	E	W	S, R	0.9	100
Bronco Creek	E	W	S, R	1.5	100
Bunker Creek	E	W	S, R	6.4	100
Copsey Creek	E	W	S, R	1.1	100
Cow Creek	E	R	F	30	9
Cowley Creek	E	W	S, R	0.8	100
Ditch Creek	E	W	S, R	2.1	78
East Fork Elk Valley Creek	E	R	F	2.3	70
Elk Valley Creek	E	R	F	5.0	29
Kelsey Creek	E	W	S, R, F	4.8	100
Meadow Creek	E	W	S, R	3.8	98
Mule Creek	E	W	S, R, F	7.6	99
Quail Creek	E	W	S, R	1.8	91
Quines Creek	E	R	F	4.5	13
Riffle Creek	E	R	F	3.6	28
Russian Creek	E	W	S, R	1.9	100
Slide Creek	E	W	S, R	1.0	90
Stanley Creek	E	R	F	1.5	49
Whiskey Creek to east and west forks	E	W	S, R, H	2.4	84
East Fork Whiskey Creek	E	W	S, R	3.7	100
West Fork Whiskey Creek	E	W	S, R	6.0	100
Whitehorse Creek	E	R	F	3.5	49
Grants Pass Resource Area					
Anna Creek	E	W	S, R	1.7	100
Ash Creek	E	W	S, R	2.6	82
Bailey Creek	E	W	S, R	2.7	92
Big Windy Creek	E	W	S, R	6.8	97

Table 3-WS-2. NRI-Listed and Other Potential Rivers (continued)

River Name	Eligibility[1]	Highest Potential Classification[2]	Outstandingly Remarkable Values[3]	Total River Miles	Percent BLM[4]
Centennial Gulch	E	W	S, R	1.8	73
Cheney Creek	E	R	F	4.2	19
Deer Creek	NE			11	4
Dulog Creek	E	W	S, R	1.7	100
East Fork Big Windy Creek	E	W	S, R	3.5	100
East Fork Illinois River	NE			17	3
Grave Creek	E	R	F	10.9	61
Hewitt Creek	E	W	S, R	2.2	97
Hog Creek	NE			5	40
Howard Creek	E	W	S, R, F	7.0	100
Jenny Creek	E	W	S, R	4.4	100
Jumpoff Joe Creek	NE			20	20
Little Windy Creek	E	W	S, R	2.5	100
Long Gulch Creek	E	W	S, R	2.0	99
Main Branch Illinois River	NE			3	8
Missouri Creek	E	W	S, R	4.4	97
Montogmery Creek	E	W	S, R	1.3	100
North Fork Deer Creek	E	R	F	2.9	73
North Fork Galice Creek	E	R	S, R	5.5	92
North Fork Silver Creek	E	R	S, R, F	6.0	99
Pickett Creek	NE			6	40
Powell Creek	E	R	S, R, F	7.7	60
Quartz Creek	E	W	S, R	2.4	100
Rough and Ready Creek	NE			5	30
Rum Creek	E	W	S, R	3.2	100
South Fork Deer Creek	NE			6	55
Stratton Creek	NE			4	38
Taylor Creek	NE			9.5	3
West Fork Illinois River	E	S	S	19	22
Wildcat Creek	E	W	S, R	1.7	100

[1] E: Eligible - for inclusion in the National Wild & Scenic Rivers System.
NE: Not eligible - for inclusion in the National Wild and Scenic Rivers System.
[2] W: Wild
S: Scenic
R: Recreational
[3] S: Scenic
R: Recreation
F: Fish
H: Historic
P: Prehistoric
T: Native American Indian Traditional Use
W: Wildlife
[4] Percentage of BLM-administered land. Suitability studies will be completed on eligible rivers where the BLM has substantial control of the shoreline (i.e., 40 percent BLM-administered land). Suitability study will also be completed for Jenny Creek (39 percent).

Most recreation use in the planning area occurs within the Rogue National Wild and Scenic River SRMA and the Hyatt Lake-Howard Prairie Lake SRMA. Extensive recreation management areas and potential SRMAs provide an equal amount of recreational use associated with extensive, unstructured or dispersed recreation activity occurring on roads, streams, rivers, and undeveloped forestland (see Tables 3-REC-7 through 9).

Two tracts of BLM-administered roadless areas remain in a semi-primitive, nonmotorized recreation opportunity spectrum condition adjoining the Rogue National Wild and Scenic River SRMA "Wild Section" within the Grants Pass and Glendale resource areas. These tracts may provide opportunities for unstructured dispersed back country recreation activities. Current recreational use is unknown.

Within the planning area, BLM manages 13 developed recreation sites, more than 78 miles of developed hiking/horseback riding trails, 18 miles of developed cross country ski trails, and 32 miles of developed snowmobile trails. Additional miles of casual use trails have been developed by horseback riders and motorcycle riders utilizing private and BLM-administered lands, however, these trails are not accounted for. There are 529 miles of streams crossing BLM-administered lands that support fishable populations of trout, steelhead, and salmon. More than 840,000 acres are open to hunting (see Tables 3-REC-1 through 9 and Map 3-14).

In accordance with laws and regulations, off-highway vehicle (OHV) allocations in the current management plan (NA) provide 820,100 acres "open" for public use, 18,900 acres "limited" to seasonal restrictions/ existing roads, and 19,500 acres "closed." All BLM-administered recreation trails (78 miles) are "closed" to OHV use. The Pacific Crest National Scenic Trail is "closed" to mountain bike use. The Pacific Crest National Scenic Trail, Sterling Mine Ditch Trail, and the Kerby Peak Trail are "limited" to hiking and equestrian use. The Grizzly Peak Trail is "open" to mountain bike use.

Recreational access to BLM-administered lands is limited to roads that BLM has an exclusive right-of-way road easement on. Many BLM-administered lands and roads the public uses do not clearly have legal access, but the land owner or permittee allows the public to use these roads. However, the landowner could legally close these roads at any time. Although BLM roads may provide legal access, they are not public roads as are state highways and county roads. The BLM may by management decision close BLM roads to the public.

Administrative closures have been placed on approximately 860 miles of BLM-administered roads in the planning area (see Roads Section for other road closures). Approximately 500 miles of road have been "closed" by barricades, and 360 miles of have been gated for "limited" seasonal access. These are primarily logging spur roads developed for timber sales and represent about 20 percent of the BLM-administered transportation network. These administrative actions are not off-highway vehicle (OHV) allocations but were taken to protect the roads and other resource values such as wildlife and reforested harvest units.

Most motorized OHV use occurs on lands in the Timber Mountain, Johns Peak, Ferris Gulch, West Fork Evans Creek, and Quartz Creek areas. The district has permitted organized OHV events in the Timber Mountain area since 1979 for motorcycle and mountain bike races. The above areas have been identified as potential ATV management areas. See Roads Section for other road closures.

BLM's National Back Country Byway program identifies and publicizes scenic/multiple use management driving opportunities on lesser traveled roads through BLM-administered land. In the planning area, the Hellgate-Galice Back Country Byway (39 miles) and the Grave Creek-Marial Back Country Byway (33 miles) has been designated. The U.S. Forest Service designated Highway 62 (Crater Lake Highway) as part of their Rogue-Umpqua National Scenic Byway. Fifty-six miles of the byway is within the planning area (see Map 3-13).

Recreation-related use including all activities that occur within existing SRMAs and extensive recreation management areas was slightly less than 1.7 million recreation visits in 1987 (Hospodarsky 1989). Of these visits, about 17 percent were nonresidents engaged in nonconsumptive recreation use of BLM-administered land (see Table 3-REC-10).

Recreation uses at any given time and location in extensive recreation management areas is relatively light. The capacity of the extensive recreation management areas and existing/potential SRMAs to handle foreseeable recreation use demand will not be exceeded for many decades. Current uses of developed recreation sites is estimated at 40 percent of capacity on a seasonal operation basis. An extended drought has affected recent recreational use associated with water resources. Reservoir levels have been so low that boaters have had limited access and area scenic quality has been lower.

Table 3-REC-1. Existing Developed Recreation Sites

Site Name	Acres	Visits 1990[1]	Facilities
Ashland Resource Area (Jackson County)			
Beene Cabin	10	4,000	Pacific Crest National Scenic Trail, vault toilets.
Hyatt Lake[2]	745	48,000	27 RV sites, 45 campsites, 40 picnic sites, 2 flush toilets w/showers, 4 flush toilets, 2 fish cleaning shelters, 6 electric cooking shelters, 2 boat ramps, trailer dump station, administrative/maintenance shop site, sand swimming beach at Hyatt Lake. Fee site.
Kenney Meadows	35	2,400	6 picnic sites, vault toilets at Yale Creek.
Little Applegate	20	6,000	22 picnic sites, vault toilets, water, at Little Applegate River.
Little Hyatt	2	2,000	Picnic site on Little Hyatt Reservoir.
Table Mountain	10	5,000	Snow play area, vault toilets at Hyatt Lake.
Woodrat Mountain	20	5,000	Hang-gliding site, scenic viewpoint of Applegate River Valley.
Butte Falls Resource Area (Jackson County)			
Elderberry Flat	80	5,900	10 campsites, 12 picnic sites, vault toilets, located on West Fork Evans Creek.
Gold Nugget	53	6,200	22 picnic sites, vault toilets, water, on the Rogue River.
Lower Table Rock ACEC	5	6,000	Day use/parking.
Upper Table Rock ACEC	5	4,000	Day use/parking.
Glendale Resource Area (Curry County)			
Mt. Bolivar Trailhead	2	[3]	Day use\wilderness staging area.
Tucker Flat	20	4,200	12 campsites, vault toilets, water, at Rogue River Ranch on Mule Creek.

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[1] Estimates are derived from traffic counts at selected locations, receipt envelopes collected at some developed recreation sites, and observations by BLM employees.

[2] Includes Hyatt Lake and North and South Overflow areas.

[3] No data available.

Table 3-REC-2. Potential Recreation Sites

Site Name	Acres	Potential Developed Facilities
Ashland Resource Area (Jackson County)		
Anderson Butte	80	Day-use site at Anderson Butte
Applegate	10	Day-use site at Applegate River
Blue Jay Spring	40	Campsite at Blue Jay Spring
China Gulch	40	OHV use area
Dick Lake	40	Day-use site at Dick Lake
Fredenburg Spring	40	Campsite at Fredenburg Spring
Jenny Creek	40	Campsite at Jenny Creek
Parsnip Lakes	40	Campsite at Parsnip Lakes
Pilot Rock	20	Trailhead to Pacific Crest National Scenic Trail
Sensenig Falls	40	Day-use site at Sensenig Falls
Soda Mountain	20	Scenic viewpoint
South Fork Little Butte Creek	40	Day-use site at South Fork Butte Creek
Star Gulch	40	Day-use site at Star Gulch
The Licks	40	Day-use, access site to Jenny Creek
Thompson Creek	240	Day-use site at Thompson Creek
Upper Applegate	40	Day-use site at Applegate River
Yale Creek	60	Campsite on Yale Creek
Timber Mountain	10	OHV area south of Gold Hill
Ferris Gulch	10	OHV area west of Applegate
Butte Falls Resource Area (Jackson County)		
Box Creek	40	Access site at Butte Creek
Brush Creek	10	Day-use site at Rogue River
Clark Creek	160	Campsite at Clark Creek
Cobleigh Bridge	40	Access site at Butte Creek
Elk Creek	80	Campsite at Elk Creek
Flounce Rock	20	Scenic viewpoint of Lost Creek Lake
Fredenburg	40	Access site at Big Butte Creek
Gold Nugget South	5	Access site at Rogue River
Middle Creek	80	Campsite at Middle Creek
Morine Creek	40	Campsite at Morine Creek
North Fork Big Butte Creek	20	Access site at North Fork Big Butte Creek
Nugget Falls	5	Access site at Rogue River
Raspberry	20	Day-use site at West Fork Evans Creek
Rocky Hill	10	Access site at Butte Creek
Rocky Point	40	Day-use site at Rogue River
Seth Bullis	160	Campsite on Lost Creek Lake
Skookum Creek Wayside	5	Day use
South Fork Big Butte Creek	20	Day-use site at South Fork Big Butte Creek
Spot Creek	40	Campsite at Spot Creek
Sugar Pine	30	Access site to USFS Bitterlick roadless area
Tin Shed	20	Day-use site at West Fork Evans Creek
Touvelle	20	Access site at Rogue River
Upper Elk Creek	160	Campsite at Elk Creek

Table 3-REC-2. Potential Recreation Sites (continued)

Site Name	Acres	Potential Developed Facilities
Glendale Resource Area (Douglas County)		
Burma Pond	20	Campsite at Burma Pond
Cold Springs	10	Campsite proximate to Wild Rogue Wilderness
Salmon Creek	40	Campsite at Salmon Creek
Galesville Reservoir	40	Campsite at Galesville Reservoir
Ninemile	5	Campsite at Ninemile Spring
Panther Creek	5	Campsite at Panther Creek
Riffle Creek	5	Campsite at Riffle Creek-Cow Creek
Skull Creek	5	Campsite at Skull Creek-Cow Creek
Grants Pass Resource Area (Josephine County)		
Deer Creek	40	Campsite on Deer Creek near Lake Selmac
Eight Dollar Mountain Wayside	20	River Front Day use, parking, trail
Hobson Horn Overlook	20	Day use
Illinois River Extension	40	Day-use site at Illinois River east of Cave Junction
Logan Cut Equestrian Park	160	Developed campground; horse trail and horse arena
Manzanita Cave	20	Interpretive spelunking site
Old Channel Mine	20	Interpretive mining site
Rockydale	40	Campsite at Rocky Glade
Rogue River Corridor		Sites identified and developed as part of Rogue River recreation activity planning
Sexton Mountain Overlook	120	Scenic viewpoint of Grants Pass and Rogue River valley
Shady Branch	40	Campsite at North Fork Silver Creek
Sourgrass	24	Campsite at North Fork Silver Creek
Lime Rock Cave	20	Interpretive spelunking site
Waldo Cemetery	20	Historic site
Logan Cut	80	Equestrian Site east of O'Brien
Quartz Creek	10	OHV area northwest of Merlin

Table 3-REC-3. Existing Trails

Trail Name	Miles	Visits 1990[1]	Access
Ashland Resource Area (Jackson County)			
Armstrong Gulch Trail	1	1,000	Same as Sterling Mine Ditch Trail below and access via Sterling Creek Road to Armstrong Gulch Road.
Bear Gulch Trail	1	2,000	Same as Sterling Mine Ditch Trail.
Grizzly Peak Trail	1.5		Trail to Grizzly Peak, partially completed. Access from Shale City Road.
Hidden Creek Trail	1	1,000	On Anderson Butte, access via Griffin Creek Road.
Listening Tree Trail	1	1,000	On Anderson Butte, access via Griffin Creek Road.
Pacific Crest	40	10,000	Located in the southwestern Cascade Mountains, National Scenic Trail access via Interstate 5, State Highway 66, Hyatt Lake Recreation Site, Dead Indian Memorial Road, and the Keno access road. Hyatt Lake, Beane Cabin Recreation Sites, 2 undeveloped campsites along the 40 miles of trail. Closed to vehicular traffic.
Sterling Mine Ditch Trail	10	2,000	Within the upper Little Applegate River Valley, access via Sterling Creek Road and Little Applegate River Road, and the Little Applegate Recreation Site.
Tunnel Ridge Trail	1	2,000	Same as Sterling Mine Ditch Trail
Wolf Gap Trail	4	1,000	Same as Sterling Mine Ditch Trail Road above, access via Sterling Creek Road to Demstrong Gulch Road.
Butte Falls Resource Area (Jackson County)			
Lower Table Rock	2	6,000	Access via Hwy. 234, Table Rock Road Trail to Wheeler Road.
Upper Table Rock Trail	2	4,000	Access via Hwy. 234, Modoc Road.
Glendale Resource Area (Curry County)			
Kelsey Pack Trail	3	0	Within the Rogue National Wild and Scenic River wild section, access via Rogue River National Recreation Trail.
Mt. Bolivar Trail	1.5	[2]	Within the Wild Rogue Wilderness, access via Elk Valley Road.
Mule Creek Trail	3.	1,000	Within the Wild Rogue Wilderness, acess via Grave Creek-Marial National Back Country Byway at Tucker Flat recreation site.

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[1] Visitation estimates are derived from traffic counts at selected locations, receipt envelopes collected at some developed recreation sites, and observations by BLM employees.

[2] Unknown.

Table 3-REC-4. Potential Trails

Trail Name	Miles	Access
Ashland Resource Area (Jackson County)		
Hyatt Lake-Howard Prairie Lake Trail	14	Trail from Lily Glen County Park along east shore of Howard Prairie reservoir and to west shoreline of Hyatt reservoir to Hyatt Lake Recreation Site.
Butte Falls Resource Area (Jackson County)		
Buck Rock-Berry Rock	10	Ridge loop trail between Lost Creek Loop Trail reservoir and Elk Creek. Access from Trail Creek.
Green Top Loop Trail	10	Ridgetop trail above Rogue River. Access from Big Butte Creek.
Medco Railroad Trail	50	Historic logging railroad. Opportunity for "Rails To Trails and Adventures in the Past" programs. Access from Eagle Point and Butte Falls.
Glendale Resource Area (Curry County)		
Bald Ridge Trail	2.5	Access to historic area.
Kelsey Pack Trail Extension	2.5	Trail to Wild Rogue Wilderness. Access from Rogue River National Recreation Trail.
Upper Mule Creek	24	Closed road system to protect elk.
Rogue River Wild & Scenic Connector Trail	60	Trail from Graves Creek to Prospect.
Glendale Resource Area (Douglas County)		
Galesville	8	Trail within Galesville Reservoir SRMA. Access from Cow Creek Road.
King Mountain	1	Trail from King Mountain Rock Garden ACEC. Access from King Mountain Road.
Glendale Resource Area (Josephine County)		
London Peak-Grave Creek Trail	3	Trail from Grave Creek Boat Ramp/Trailhead to London Peak. Access from Grave Creek Road. Segment of Rogue River Wild & Scenic connector trail.
Grants Pass Resource Area (Josephine County)		
Grayback Mountain Trail	6.5	Trail from Williams Valley to USFS Boundary National Scenic Trail.
Kerby Peak Trail	8	On Kerby Peak, access via Highway 199 to Deer Creek Road.
Lake Selmac Loop Trail	11	Trail around Lake Selmac. Access from Josephine County, Lake Selmac Park.
Round Top Mountain CCC Trail	5	CCC Trail to No Name Cave. Access from Jackson Creek.

Table 3-REC-5. Existing National Scenic/Back Country Byways

Byway Name	Miles	Access
Butte Falls Resource Area (Jackson County)		
Rogue-Umpqua Byway	56	Access from Interstate Hwy. 5. National Scenic
Glendale Resource Area (Josephine & Curry counties)		
Grave Creek-Marial Back Country Byway	33	Access from Hellgate-Galice Back Country Byway at Grave Creek.
Grants Pass Resource Area (Josephine County)		
Hellgate-Galice Back Country Byway	39	Access from Interstate Hwy. 5.

Table 3-REC-6. Potential National Scenic/Back Country Byways

Byway Name	Miles	Access
Ashland Resource Area (Jackson County)		
Hyatt Lake-Howard Prairie Lake Back Country Byway	39	Access from Hwy. 66 at BLM east shore Hyatt Lake road and Dead Indian Memorial Road at Howard Prairie Reservoir.
McKee Bridge-Anderson Butte Loop Road Back Country Byway	35	Access from Griffin Creek Road.
Shale City-Back Countery Byway	10	Access from Dead Indian Memorial Road.
Butte Falls Resource Area (Jackson County)		
Butte Falls-Prospect Highway Back Country Byway	24	Access from Hwy. 62.
Glendale Resource Area (Josephine, Curry & Coos counties)		
West Fork Cow Creek-Eden Valley Back Country Byway	23	Access from Interstate Hwy. 5.
Glendale Resource Area (Douglas County)		
Lower Cow Creek	18	Access from Interstate Hwy. 5.
Glendale and Butte Falls Resource Areas (Douglas & Jackson counties)		
Cow Creek-West Fork Evans Creek Road Back Country Byway	56	Access from Interstate Hwy. 5.
Grants Pass Resource Area (Josephine County)		
Williams-Selma Back Country Byway	30	Access from Hwy. 199 to Hwy. 238.

Table 3-REC-7. Existing Special Recreation Management Areas

SRMA Name	Size (Acres)	1990 Visits[1]	OHV Designation (Acres)	Activities	Facilities
Ashland Resource Area (Jackson County)					
Hyatt Lake-Howard Prairie Lake	17,000	65,200	Open 16,840 limited 160 closed 0	Sightseeing, camping, boating, picnicking, fishing, hiking, swimming, biking, horseback riding, and cross-country skiing.	Hyatt Lake, North Overflow, South Overflow, Table Mtn. Recreation Sites (90 campsites, 40 picnic sites, 2 restrooms w/flush toilets-hot showers, 4 restrooms w/flush toilets, 3 vault toilets, 2 boat ramps, and skiing, 2 fish cleaning stations, snowmobiling, trailer dump station, 20 miles of hiking/equestrian trails (Pacific Crest National Scenic Trail), 18 miles of cross-country ski trails, 32 miles of snowmobile trails, a winter snow play hill, and 14 summer home lease tracts.
Pacific Crest National Scenic Trail	12,086	10,400	Open 0 limited 11,796 closed 290	Hiking, horseback riding, sight-seeing, nature study, camping, picnicking, and cross-country skiing.	Located in the southwestern Cascade Mountains with access via Interstate 5, State Highway 66, Hyatt Lake Recreation Site, Dead Indian Road, and the Keno access road. Beene Cabin, Hyatt Lake Recreation Sites, 2 undeveloped campsites along 40 miles of trail. The trail itself is closed to motorized and mechanized traffic.
Grants Pass Resource Area (Josephine & Curry counties)					
Rogue National W&S River	14,267	588,000	Open 1,282 limited 217 closed 12,758	White-water rafting, boating, sightseeing, fishing, camping, picnicking, hiking, and swimming.	Tucker Flat Recreation Site with 12 campsites, 4 semideveloped recreation sites with 2 campsites and picnic sites, 26 undeveloped campsites, 1 boat ramp, forest roads, 2 National Register historic sites, Hellgate-Galice and Grave Creek-Marial National Back Country Byways, 30 miles of hiking trails, and 169 scenic easements on 176 parcels of private land, 1 administrative/ visitor center, and 1 Josephine County Park under R&PP lease.

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[1] Estimates derived from traffic counts at selected locations, receipt envelopes collected at some developed recreation sites, and observations by BLM employees.

Table 3-REC-8. Potential Special Recreation Management Areas (PSRMA)

SRMA Name	Size (Acres)	OHV Designation (Acres)	Potential Use	Amenities
Ashland Resource Area (Jackson County)				
Soda Mountain	5,867	Open 0 limited 5,867 closed 0	Hiking, horseback riding, camping, sightseeing, nature study and special management area.	Limited 20 miles east of Ashland with access via Highway 66 toSoda Mountain Road and the Pacific Crest National Scenic Trail.Cascade and Klamath mountains divide on the south slope with panoramic vistas of Klamath River valley and Mount Shasta, California. Potential addition to Wilderness System.
Butte Falls Resource Area (Jackson County)				
Elk Creek Reservoir	4,676	Open 4,676 limited 0 closed 0	Lakeshore recreation sites/trails.	Dam and reservoir being considered by Army Corps of Engineers. Located 30 miles northeast of Medford.
Lost Creek Reservoir	9,492	Open 7,042 limited 0 closed 2,450	Sightseeing, camping boating, picnicking, fishing, hiking, swimming, hunting and recreation on lakeshore.	Located 30 miles northeast of Medford with access via Highway 62 (Umpqua-Rogue National Scenic Byway). Recreation facilities include two state parks and 26 miles of hiking trails, Army Corps of Engineers parks, visitor center and fish hatchery.
Glendale Resource Area (Douglas County)				
Galesville Reservoir	3,977	Open 3,977 limited 0 closed 0	Campsite/trails.	Located 12 miles northeast of Glendale with access via Interstate 5 to Cow Creek Road. Recreation facilities include One Douglas County Park with day-use facilities.

Table 3-REC-9. Existing Extensive Recreation Management Areas (EERMA)

EERMA Name	Size (Acres)	1990 Visits[1]	OHV Designation (Acres)		Use	Amenities
Jackson County						
Ashland Resource Area	214,649	311,900	Open limited closed	207,359 6,720 570	Camping, general sightseeing (driving, wildlife observation), hunting, fishing, plant collecting, hang gliding, winter sports, driving, on/off-highway recreation vehicles and picnicking.	Little Applegate, Kenney Meadows Recreation sites (10 campsites, 50 picnic units), 3 undeveloped recreation sites, forest roads, Soda Mountain Wilderness Study Area (WSA), 30 miles of hiking/equestrian trails, 3 national historic trail sites, and a Jackson County Park under R&PP lease.
Butte Falls Resource Area	206,154	258,100	Open limited closed	202,624 0 3,530	Camping, hunting, picnicking, general sight-seeing (driving for pleasure, viewing scenery, wildlife observation), fishing, plant collecting and driving on/off-highway recreation vehicles.	Gold Nugget, Elderberry Flat Recreation Sites (10 campsites, 30 picnic sites), Upper and Lower Table Rocks ACEC, and 4 miles of hiking/equestrian trials.
Josephine County						
Grants Pass Resource Area	235,570	430,389	Open limited closed	219,620 0 15,890	Camping, general sight-seeing (driving for pleasure, viewing scenery, wildlife observation), hunting fishing, hiking, driving on/off-highway recreation vehicles, horseback riding, vegetation gathering (mushrooms), and picnicking.	Eight miles of hiking and equestrian trails, forest roads, Hellgate-Galice National Back Country Byway, Eight Dollar Mountain ACEC, Brewer Spruce, Woodcock Bog RNAs. Three developed recreation sites managed by Josephine County, the City of Grants Pass, and the State of Oregon under R&PP leases.
Josephine & Douglas counties						
Glendale Resource Area	158,820	494,700	Open limited closed	158,730 0 90	Camping, general sightseeing (driving for pleasure, viewing scenery, wildlife observation), hunting, fishing, hiking, and driving on/off-highway recreation vehicles, and picnicking.	Grave Creek-Marial National BackCountry Byway, 4 primitive campsites, Wild Rogue Wilderness trailheads at Tucker Flat Recreation Site and Mount Bolivar, King Mountain Rock Garden ACEC, and 8 miles of hiking trails.

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[1] Visitation estimates are derived from traffic counts at selected locations, receipt envelopes collected at some developed recreation sites, and observations by BLM employees.

Motorized travel visits and other land based visits (nature study, wildlife viewing, outdoor photography, visiting interpretive displays, picnicking) account for 47 percent of total visitation and are by far the most popular recreation activities that occur on BLM-administered land. Nonmotorized travel visits (day and overnight hiking/backpacking on trails, bicycling off the road, horseback riding) and all modes of overnight camping account for another 20 percent (see Table 3-REC-10).

Management of the Rogue National Wild and Scenic River SRMA will not be addressed in this RMP. A joint revised management plan for the river is currently being prepared as a separate document by the Grants Pass Resource Area Rogue River Staff and the Siskiyou National Forest Rogue River Staff. There are 41 developed recreation sites, 2 National Historic Register sites, and 30 miles of trails within the Congressional boundary of the river. The Rogue National Wild and Scenic River corridor and all recreation sites are closed to hunting.

During the last decade, possible user conflicts surfaced about jet boat use/traffic/safety, their effects on salmon-steelhead fisheries, and streambank erosion on the Rogue National Wild and Scenic River "Recreation Section." These conflicts will be addressed in the "Revised" Rogue River management plan.

Table 3-REC-10. Recreation Visits to BLM-Administered Land

Recreation Use Category	1987 Visits	Percent of Total Visits
Off-highway use	175,000	10.4
Motorized travel	296,400	17.6
Nonmotorized travel	172,000	10.2
Camping	176,000	10.5
Hunting	136,800	8.1
Other land-based	320,000	19.1
Fishing	194,900	11.6
Boating[1]	111,000	6.6
Other water-based	63,700	3.8
Winter sports	32,600	1.9
Snowmobiling	1,700	[2]
Total	**1,680,100**	**99.7[3]**

[1] Based on District inventory data. Hospodarsky did not account for any boating in Region 9 data base.
[2] Less than one percent.
[3] Does not add to 100 percent due to rounding.
SOURCE: Hospodarsky 1989

Concern over timber management along the Pacific Crest National Scenic Trail is being addressed in this plan.

Timber Resources

Sustained yield units (SYUs) are administrative units for which an probable sale quantity (PSQ) is calculated. The three SYUs found in the Medford District are the Jackson, Josephine, and Klamath SYUs. In 1988, the Klamath SYU was divided between the Medford District and the Klamath Falls Resource Area of the Lakeview District. Therefore, data for the Klamath SYU is presented for both the Medford District and Klamath Falls portions. Additionally, Table 3-T-4 shows accomplishments for the combined Jackson/Klamath SYUs because the management framework plans (MFP) and associated 1980 Record of Decision were combined for these two SYUs. Unless otherwise noted, figures for SYU totals are for Medford District only.

Inventories

BLM's measure of the available timber resource is based on three forest inventories: for land suitability, to provide operational data, and an extensive inventory used to define the existing standing volume of the forest. These inventories provide resource data needed to develop both day-to-day management plans and long-term land use plans. This section describes those inventories and compares the 1977 and the 1988 inventories. In addition, it presents harvesting and reforestation information.

Timber Production Capability Classification Inventory

The land suitability inventory is called the timber production capability classification (TPCC) system. This complex inventory process classifies the land into major classes based on its physical and biological capabilities to support and produce forest products on a sustained basis (see Table 3-T-1 and Figure 3-T-1).

Table 3-T-1. TPCC Summary, October 1, 1988

Category	Acres[1] O&C	PD	Total
Josephine SYU			
Nonforest			
Rockland, brush, grass	870	134	1,004
Water	2,102	260	2,362
Highway (roads)	12,790	1,387	14,177
Utility	146	24	170
Agriculture	207	534	741
Nonforest unclassified	5,326	1,681	7,007
Subtotal	21,441	4,020	25,461
Nonsuitable woodland			
Fragile nonsuitable	32,017	2,420	34,437
Suitable woodland			
Low site	23,127	8,340	31,467
Noncommercial species	1,392	357	1,749
Nonsuitable commercial forestland (reforestation problem)	38,707	6,604	45,311
Subtotal	63,226	15,301	78,527
Suitable commercial forestland			
Nonproblem	612	0	612
Cat. I - reforestation problem	215,752	22,006	237,758
Combination reforestation and fragile[2]	48,236	3,285	51,521
Subtotal	264,600	25,291	289,891[3]
Total	381,284	47,032	428,316
Jackson SYU			
Nonforest			
Rockland, brush, grass	13,403	4,107	18,010
Water	596	57	653
Highway	11,557	762	12,319
Utility	759	107	866
Agriculture	124	30	154
Nonforest unclassified	13,184	2,692	15,876
Subtotal	40,123	7,755	47,878
Nonsuitable woodland			
Fragile nonsuitable	5,238	405	5,643
Suitable woodland			
Low site	36,045	8,217	44,262
Noncommercial species	27,246	8,514	35,760
Nonsuitable commercial forestland (reforestation problem)	18,616	3,342	21,958
Subtotal	81,907	20,073	101,980

Table 3-T-1. TPCC Summary, October 1, 1988 (continued)

Category	Acres[1] O&C	PD	Total
Suitable Commercial forestland			
Nonproblem	0	0	0
Cat. I - reforestation problem	133,157	11,349	144,506
Combination reforestation and fragile[2]	86,187	8,541	94,728
Subtotal	219,344	19,890	239,234[3]
Total	346,612	48,123	394,735
Klamath SYU (Medford)			
Nonforest			
Rockland, brush, grass	1,465	886	2,351
Water	545	20	565
Highway (roads)	1,500	41	1,545
Utility	238	15	253
Agriculture	0	0	0
Nonforest unclassified	371	224	595
Subtotal	4,119	1,186	5,305
Nonsuitable woodland			
Fragile nonsuitable	239	119	358
Suitable woodland			
Low site	5,673	2,059	7,732
Noncommercial species	441	479	920
Nonsuitable commercial forestland (reforestation problem)	393	29	422
Subtotal	6,507	2,567	9,074
Suitable commercial forestland			
Nonproblem	0	0	0
Cat. I - reforestation problem	28,385	0	28,385
Combination reforestation and fragile[2]	1,154	220	1,374
Subtotal	29,539	220	29,759[3]
Total	40,404	4,092	44,496
Klamath SYU (Klamath Falls RA)			
Nonforest			
Rockland, brush, grass	890	400	1,290
Water	40	40	80
Highway (roads)	1,780	130	1,910
Utility	180	120	300
Agriculture	0	0	0
Nonforest unclassified	0	0	0
Subtotal	2,890	690	3,580
Nonsuitable woodland			
Fragile nonsuitable	350	20	370

Table 3-T-1. TPCC Summary, October 1, 1988 (continued)

Category	Acres[1] O&C	PD	Total
Suitable woodland			
Low site	2,580	1,410	3,990
Noncommercial species	570	500	1,070
Nonsuitable commercial forestland (Reforestation Problem)	80	70	150
Subtotal	3,230	1,980	5,210
Suitable commercial forestland			
Nonproblem	0	0	0
Cat. I - reforestation problem	39,880	1,908	41,788
Combination reforestation and fragile[2]	110	0	110
Subtotal	39,990	1,908	41,898[3]
Total	46,460	4,598	51,058
Klamath SYU (Total)			
Nonforest			
Rockland, brush, grass	2,355	1,286	3,641
Water	585	60	645
Highway (Roads)	3,280	171	3,451
Utility	418	135	553
Agriculture	0	0	0
Non-forest unclassified	371	224	595
Subtotal	7,009	1,876	8,885
Nonsuitable woodland			
Fragile nonsuitable	589	139	728
Suitable woodland			
Low site	8,253	3,469	11,722
Noncommercial species	1,011	979	1,990
Nonsuitable commercial forestland (reforestation problem)	473	99	572
Subtotal	9,737	4,547	14,284
Suitable commercial forestland			
Nonproblem	0	0	0
Cat. I - reforestation problem	68,265	1,908	70,173
Combination reforestation and fragile[2]	1,264	220	1,484
Subtotal	69,529	2,128	71,657[3]
Total	86,864	8,690	95,554
Jackson, Josephine, Klamath SYUs, Combined			
Nonforest			
Rockland, brush, grass	17,128	5,527	22,655
Water	3,283	377	3,660
Highway (Roads)	27,627	2,320	29,947
Utility	1,323	266	1,589
Agriculture	331	564	895
Non-forest unclassified	18,881	4,597	23,478
Subtotal	68,573	13,651	82,224
Nonsuitable woodland			
Fragile nonsuitable	37,844	2,964	40,808

Table 3-T-1. TPCC Summary, October 1, 1988 (continued)

Category	Acres[1] O&C	PD	Total
Suitable woodland			
Low site	67,425	20,026	87,451
Noncommercial species	29,649	9,850	39,499
Nonsuitable commercial forestland (reforestation problem)	57,796	10,045	67,841
Subtotal	154,870	39,921	194,791
Suitable commercial forestland			
Non-problem	612	0	612
Cat. I - reforestation problem	417,174	35,263	452,437
Combination reforestation and fragile[2]	135,687	12,046	147,733
Subtotal	553,473	47,309	600,782[3]
Total	814,760	103,845	918,605
Medford District[4]			
Nonforest			
Rockland, brush, grass	16,238	5,127	21,365
Water	3,243	337	3,580
Highway (roads)	25,847	2,190	28,037
Utility	1,143	146	1,289
Agriculture	331	564	895
Nonforest unclassified	18,881	4,597	23,478
Subtotal	65,683	12,961	78,644
Nonsuitable woodland			
Fragile nonsuitable	37,494	2,944	40,438
Suitable woodland			
Low site	64,845	18,616	83,461
Noncommercial species	29,079	9,350	38,429
Nonsuitable commercial forestland (reforestation problem)	57,716	9,975	67,691
Subtotal	151,640	37,941	189,581
Suitable commercial forestland			
Nonproblem	612	0	612
Cat. I - reforestation problem	377,294	33,355	410,649
Combination reforestation and fragile[2]	135,577	12,046	147,623
Subtotal	513,483	45,401	558,884[3]
Total	768,300	99,247	867,547

[1] Digitized acres utilizing GIS.

[2] Includes all acres classified as fragile suitable TPCC. Classifications are described in Appendix 3-T-1, Draft RMP. Acquired lands are included with the PD totals.

[3] Total forest acres. Includes forest acres contained in riparian management areas, recreation sites, and Congressionally-designated wild and scenic river areas and wilderness areas.

[4] Includes the Josephine, Jackson, and portion of the Klamath SYU within the Medford District.

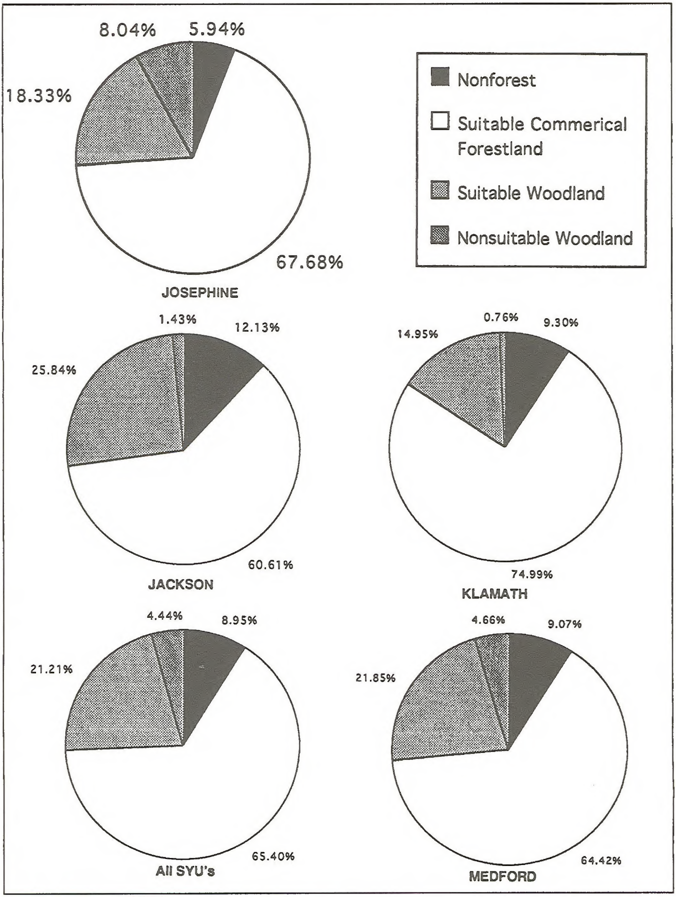

Figure 3-T-1. *Timber Production Capability Classification.*

In the TPCC inventory, land is classified as either forestland or nonforestland (see Appendix 3-T-1, Draft RMP). Nonforestland is defined as sites incapable of maintaining at least 10 percent stocking of forest trees. It includes quarries, roads, utility corridors, and other sites converted to nonforest uses. Forestland is defined as sites which are now, or are capable of being, at least 10 percent stocked by forest trees and are not developed for nonforest use.

Forestland is categorized as suitable commercial forestland, suitable woodland, or nonsuitable woodland. The PSQ is based on the total number of acres classified as suitable commercial forestland and the number that are available for timber production.

The 1988 TPCC inventory identified 67,841 acres of suitable woodland-reforestation problem acres from which a limited amount of conifer timber could be harvested (see Table 3-T-1). The capability to promptly reforest these lands using planting or seeding techniques is largely unknown, however, given sufficient time, they appear to be capable of achieving reforestation by natural means.

Another 22,637 acres were inventoried as fragile gradient-nonsuitable. These are steep, rocky lands on which tree planting is difficult (this is a portion of the acreage identified as nonsuitable woodland, fragile-nonsuitable in Table 3-T-1). Based on observations made after the 1987 wildfires, these lands appear to be capable of natural conifer regeneration under partial cut or ecosystem based management regimes. Such regimes appear to prevent significant losses in site productivity or watershed degradation.

In 1977, the TPCC inventory classified approximately 227,000 acres in categories unavailable for sustained timber production. The 1988 TPCC reinventory was completed using a revised set of classification criteria. Suitability classifications were completed and the following considered:

- research completed by the Forestry Intensified Research (FIR) group and other researchers,
- reforestation success on operational commercial forestlands, and
- experimental harvest and reforestation trials completed by BLM on sites classified as low intensity forest management lands (LIM).

Based on the updated TPCC, there are 600,782 acres of suitable commercial forestland in the three SYUs; 558,884 acres in the Medford District, and 41,898 acres in the Klamath Falls Resource Area. This is an increase of approximately 109,000 acres from 1977.

Operations Inventory

The operations inventory (OI) includes forest type mapping showing the location of each forest type island. Records for each stand describe the species, site characteristics, acreage, and history of activity. Reforestation or timber stand improvement needs and opportunities are noted. Similar OI units are grouped together and undergo similar treatments in a computer simulation to calculate the PSQ.

Extensive Inventory

The extensive inventory provides an estimate of existing volume. The inventory process consists of a series of plots in the various kinds of timber stands which make up the forest. The primary purpose of this inventory is to provide a statistically reliable estimate of actual, current timber volume on suitable commercial forestland. This data is used in yield curves which project future growth.

Comparison of 1977 and 1988 Inventories

Data developed from these two inventories are not directly comparable. The differences are a result of:

- Reclassification of the forestland base. The TPCC and OI reclassified the entire land base within the planning area in the mid-1980s as part of the RMP process. The level of "ground proofing" of inventory data was significantly higher in the 1988 inventory.
- The 1988 OI database is more accurate than the 1976 database. When used in conjunction with the updated extensive inventory, more reliable volume estimates are provided.
- Mathematical equations to measure timber volume in individual trees of different sizes were updated. This update resulted in increased volume estimates for individual trees and correspondingly higher volume estimates for timber stands.
- Sampling procedures improved to ensure that all sample points within the extensive inventory accurately measured the intended forest type. This

improvement in sampling technique reduced the amount of "border effect" caused by sample points being located too close to a different type of timber stand.

- Age-class volume computational methods improved as a result of the more accurate OI database and improved extensive inventory sampling procedures.
- The 1988 extensive inventory does not reflect standing volume or acres contained in suitable commercial forestland allocated to 75 foot riparian management areas (on stream order 3 and greater), existing recreation sites, and Congressionally-designated Rogue Wild and Scenic River corridor or wilderness areas. The 1977 inventory for suitable commercial forestland only excluded Congressionally-designated Rogue Wild and Scenic River corridor and the Wild Rogue Wilderness.

Table 3-T-2 indicates standing conifer volumes have increased since 1976. This can be attributed to the increase in the number of acres inventoried as suitable commercial forestland and therefore

Table 3-T-2. Comparison of 1976 and 1988 Extensive Inventory Data[1]

	Acres		Cubic Volume MCF		Scribner Volume MBF	
Age Class	**1976**	**1988**	**1976**	**1988**	**1976**	**1988**
Josephine SYU						
0	10,930	18,847	0	0	0	0
5	1,762	13,393	0	0	0	0
10	13,114	8,765	0	0	0	0
20	4,412	20,674	0	0	0	0
30	3,416	10,067	4,588	10,908	21,624	56,223
40	3,684	3,914	6,374	5,698	31,553	30,889
50	2,323	5,503	4,877	12,425	24,835	70,819
60	6,079	6,410	14,899	21,547	77,253	119,283
70	3,622	4,037	10,085	17,224	52,943	96,386
80	3,420	5,684	10,602	22,455	56,147	129,503
90	10,178	6,555	34,584	35,049	184,315	204,743
100	4,825	8,795	17,746	40,818	95,015	237,913
110	7,424	8,626	29,250	37,481	157,143	220,757
120	4,238	27,853	17,733	112,687	95,495	655,896
130	2,779	11,681	12,257	54,478	66,114	321,225
140	6,536	12,128	30,191	63,719	163,004	379,884
150	8,499	29,955	40,878	134,180	220,803	827,192
160	8,575	10,099	42,726	42,190	230,768	252,298
170	3,911	3,631	20,093	17,931	108,472	107,372
180	986	4,181	5,201	21,316	28,051	127,520
190	2,376	2,585	12,816	15,179	69,037	91,665
200+	113,397	50,370	630,830	309,703	3,289,693	1,796,026
Total	226,486	273,753	945,730	974,988	4,972,265	5,725,594
Jackson SYU[2]						
0	2,465	15,348	0	0	0	0
5	712	12,588	0	0	0	0
10	3,647	7,486	0	0	0	0
20	9,367	7,889	0	0	0	0
30	1,000	6,895	2,057	1,721	10,465	8,393
40	1,084	3,796	2,458	6,1131	2,744	32,432
50	837	3,914	2,068	8,8661	0,8854	7,201
60	6,203	3,826	16,539	10,548	88,142	56,372

Table 3-T-2. Comparison of 1976 and 1988 Extensive Inventory Data[1] (continued)

	Acres		Cubic Volume MCF		Scribner Volume MBF	
Age Class	**1976**	**1988**	**1976**	**1988**	**1976**	**1988**
70	4,548	6,309	12,982	19,696	69,907	109,782
80	9,446	5,298	28,670	22,740	155,751	131,276
90	7,213	12,204	23,142	52,844	126,681	299,710
100	9,230	11,179	31,143	52,793	171,620	299,734
110	9,900	14,043	34,971	63,131	193,852	362,892
120	10,946	15,578	40,316	73,876	224,665	432,574
130	13,213	9,270	50,560	45,825	283,091	266,286
140	10,220	14,225	40,495	78,212	227,723	469,869
150	7,033	6,421	28,770	33,327	162,431	202,846
160	12,960	7,672	54,581	45,993	309,297	273,352
170	2,559	3,914	11,067	21,221	62,931	129,564
180	5,536	1,565	24,529	6,914	139,922	42,333
190	2,121	24,301	9,606	131,697	54,965	814,193
200+	69,810	38,817	349,029	200,382	2,045,415	1,238,182
Total	200,050	232,538	762,983	875,899	4,350,487	5,216,991
Klamath SYU[2,3]						
0	1,491	2,085	0	0	0	0
5	203	2,356	0	0	0	0
10	763	3,067	0	0	0	0
20	2,233	2,248	0	0	0	0
30	357	1,794	722	1,232	3,532	5,952
40	103	361	234	587	1,162	3,018
50	206	1,423	518	1,795	2,603	9,571
60	2,262	3,778	6,211	6,026	31,560	31,135
70	234	4,984	695	10,133	3,564	51,936
80	4,460	5,007	14,196	11,303	73,487	58,695
90	2,108	4,282	7,143	26,285	37,280	147,961
100	1,393	2,269	4,993	12,175	26,267	69,054
110	2,816	2,050	10,622	11,686	56,297	67,248
120	1,511	1,635	5,969	9,262	31,869	53,325
130	2,258	879	9,303	4,250	50,024	24,275
140	103	1,522	441	7,230	2,388	41,261
150	5,736	912	25,425	5,217	138,644	31,229
160	316	2,083	1,446	12,745	7,940	73,859
170	1,248	875	5,877	4,567	32,502	26,242
180	1,772	595	8,566	2,637	47,710	14,982
190	725	4,507	3,589	25,243	20,133	145,843
200+	30,098	21,305	167,462	150,599	1,019,281	923,687
Total	62,396	70,017	273,412	302,972	1,586,243	1,779,273

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[1] Conifer volume only.
[2] Data is from 1977 through 1988.
[3] Includes both Medford District and Klamath Falls Resource Area.

available for timber production. Based upon the 1988 inventory, there is an estimated 12.7 billion board feet (2.2 billion cubic feet) of standing conifer volume growing on 576,308 acres.

Hardwoods

There are approximately 46,741 acres of hardwood stands on the Medford District. Of these acres, 7,242 acres are classified as suitable commercial forestland (SCFL). As part of the analysis of data from the extensive inventory of the suitable commercial forestland, it was estimated that over 141 million cubic feet of hardwood exists. Table 3-T-8 displays hardwood volumes (thousands of cubic feet) by species and SYU. While hardwoods are present on lands other than SCFL, no current inventory exists on those lands. Hardwoods can provide locally important wildlife habitat and are currently utilized for firewood, lumber, veneer, and specialty items. Hardwoods have also been used as biomass in the production of electricity. (Also see Special Forest Products, Wildlife, and Bio Diversity.)

Harvest Data

BLM administers more than 35 percent of the total growing stock in the Medford timbershed and 30 percent in the Roseburg timbershed (Sessions 1990).

Table 3-T-3 displays the volume of conifer timber harvested by county and ownership. BLM-administered timber comprised an average of 30 percent of the total timber harvested in Jackson and Josephine counties from 1979 through 1988 (1.45 billion board feet from a total of 4.79 billion board feet).

Timber Harvest/ Development Activities

Estimated forest development accomplishments compared to actual accomplishments were used as a basis for assessing implementation of the current plan. Accomplishments for the Josephine SYU are from October 1, 1979 to October 1, 1991; accomplishments for the Jackson/Klamath SYU are from October 1, 1980 to October 1, 1991.

Precommercial thinning, commercial thinning, and fertilization are intensive management practices with direct impacts on the PSQ (see Table 3-T-4 and Table 3-T-5). The PSQ was adjusted under the previous plan to account for the loss of the use of herbicides for vegetation control and for delays in funding intensive management practices.

There was a total volume of 1,873 million board feet sold (net after buy back) through 1991 (see Table 3-T-6).

The timber EIS and RODs completed for the decade of the 1980s utilized impact analyses that were based on an emphasis on shelterwood harvest methods. Actual plan implementation involved a stronger reliance on clearcutting. Due to the potential differences in impacts, the BLM completed a plan amendment and a supplemental EIS and ROD in 1985 that provided for the use of an altered mixture of even-age practices, including a higher proportion of clearcut acres. The change resulted in a lower number of acres being harvested and differences in treatment acres for the decade.

During the decade, 2,233 acres of low intensity forest management lands (LIM) were experimentally harvested. These commercial forestlands had been withdrawn from the timber production base because it was anticipated they could not be successfully regenerated within five years of harvest. The experimental harvest of LIM lands was designed to determine if these sites could be successfully reforested utilizing common silvicultural practices such as site preparation, planting, and vegetation control.

BLM used herbicides to control competing vegetation until 1983, at which time a court injunction prevented further use. In 1983, BLM substituted manual treatment methods to replace herbicides. Reductions in the annual timber sale plans reflected the loss of this practice.

In addition, sale of timber for salvage purpose resulted in timber volume from lands allocated to uses other than timber production. This volume is not part of the allowable cut for the decade (see Table 3-T-7). Salvage was allowed within constraints required to meet other resource allocations or objectives.

Reforestation

The annual reforestation program has fluctuated from a low of 2,128 acres in 1982 to a high of 12,316 acres in 1987 (see Appendices 3-T-2, 3-T-3, 3-T-4, and 3-T-5, Draft RMP). The average annual

Table 3-T-3. Volume Harvested by County and Ownership

Year	County	Forest[1] Industry	Other[2] Private	[2] State	[3] BLM	National[4] Forest	Other[2] Public	Total
		Thousand Board Feet (Scribner Log Scale)[1]						
1977	Douglas	648,805		22,530	299,476	298,334	0	1,269,145
	Josephine	14,810		692	60,036	53,114	3,900	132,552
	Jackson	116,365		41	83,374	139,392	0	339,172
	Klamath	119,939		5,845	21,550	202,594	0	349,928
	Coos	279,306		35,597	142,281	23,390	0	480,574
	Curry	66,568		0	21,303	102,133	0	190,004
1978	Douglas	665,617	48,169	27,044	92,070	412,748	25	1,245,673
	Josephine	5,743	6,919	0	78,865	59,331	3,100	153,958
	Jackson	136,463	13,465	788	96,450	163,891	0	411,057
	Klamath	158,850	20,923	3,207	17,099	205,417	0	405,496
	Coos	287,308	33,716	64,904	159,395	22,571	3,955	571,849
	Curry	73,157	5,143	1,678	10,902	144,814	0	235,694
1979	Douglas	676,384	20,993	17,341	277,803	376,435	415	1,369,371
	Josephine	7,420	5,241	111	63,393	83,107	3,500	162,772
	Jackson	95,194	7,692	168	114,749	158,311	0	376,114
	Klamath	159,800	11,900	2,900	20,100	196,324	0	391,024
	Coos	210,127	24,363	50,611	118,473	27,125	5,756	436,455
	Curry	49,322	7,300	187	14,580	84,599	0	155,988
1980	Douglas	729,556	23,501	13,944	186,545	181,722	488	1,135,756
	Josephine	9,877	4,109	0	71,337	60,805	3,250	149,378
	Jackson	87,996	8,525	5	87,417	133,632	0	317,575
	Klamath	200,600	15,150	4,405	11,130	151,091	0	382,376
	Coos	190,350	12,375	30,074	56,078	3,813	4,351	297,041
	Curry	37,150	4,015	3	73,070	55,098	0	169,336
1981	Douglas	598,577	19,478	6,779	199,894	170,716	0	995,444
	Josephine	3,481	3,943	8	41,419	25,476	4,473	78,800
	Jackson	52,821	7,271	762	65,872	137,236	0	263,962
	Klamath	185,330	19,700	4,916	13,144	141,307	0	364,397
	Coos	203,183	14,588	36,129	53,079	5,332	3,537	315,848
	Curry	28,471	3,884	301	5,004	43,745	0	81,405
1982	Douglas	694,122	39,970	18,203	68,431	137,826	85	958,637
	Josephine	3,290	1,857	108	13,044	17,760	1,587	37,646
	Jackson	104,368	2,415	0	17,877	62,011	78	186,749
	Klamath	244,874	4,177	7,222	9,991	85,822	0	352,086
	Coos	248,975	8,637	36,406	30,135	8,538	12,098	344,789
	Curry	44,261	11,573	359	2,608	23,563	0	82,364

Table 3-T-3. Volume Harvested by County and Ownership (continued)

Year	County	Forest[1] Industry	Other[2] Private	[2] State	[3] BLM	National[4] Forest	Other[2] Public	Total
		Thousand Board Feet (Scribner Log Scale)[1]						
1983	Douglas	677,539	36,411	2,297	217,103	318,592	0	1,251,942
	Josephine	1,832	4,595	152	40,528	28,117	5,700	80,924
	Jackson	118,726	6,117	11	96,652	173,613	208	395,327
	Klamath	293,621	5,382	8,542	24,990	231,021	0	553,556
	Coos	191,367	6,122	33,145	82,009	35,115	8,735	356,493
	Curry	57,878	3,369	1,529	15,551	0	0	78,327
1984	Douglas	646,848	32,880	11,015	261,391	324,498	1,833	1,278,465
	Josephine	1,987	6,667	1,116	74,900	38,764	2,157	125,591
	Jackson	112,509	9,286	0	110,500	118,683	0	350,978
	Klamath	36,212	3,032	5,813	34,993	250,371	0	330,421
	Coos	231,306	11,575	16,741	91,578	63,374	5,440	420,014
	Curry	56,031	2,994	0	19,951	16,073	0	95,049
1985	Douglas	636,113	35,692	23,779	290,188	327,008	286	1,313,066
	Josephine	5,409	1,854	2,176	55,800	39,838	1,781	106,858
	Jackson	189,978	4,441	1,698	111,300	182,683	26	490,126
	Klamath	159,551	4,065	2,043	8,651	241,860	0	416,170
	Coos	241,388	15,253	51,925	92,650	37,887	10,895	449,998
	Curry	34,306	6,143	2,049	17,482	65,499	0	125,479
1986	Douglas	591,435	38,227	31,608	349,410	492,455	50	1,503,185
	Josephine	6,663	1,847	652	52,200	55,218	658	17,238
	Jackson	186,084	3,350	1,077	80,500	142,398	0	413,409
	Klamath	146,261	4,467	10,945	19,277	281,927	0	462,877
	Coos	269,545	30,268	21,604	132,014	33,188	4,549	491,168
	Curry	43,955	4,164	2,894	16,518	95,563	0	163,094
1987	Douglas	471,437	30,854	21,645	378,054	406,283	3,274	1,311,547
	Josephine	4,838	4,867	1,438	55,000	50,668	2,499	119,310
	Jackson	118,893	6,730	3,338	107,000	131,689	0	367,650
	Klamath	171,299	4,747	3,977	27,724	308,425	0	516,172
	Coos	263,047	23,338	25,57	132,011	29,585	16,278	489,833
	Curry	29,301	8,491	2,181	3,141	101,693	0	144,807
1988	Douglas	325,008	45,532	28,221	545,351	377,143	2,124	1,323,379
	Josephine	6,773	4,144	775	65,800	92,887	1,947	172,326
	Jackson	167,516	8,596	7,101	124,100	167,422	0	474,735
	Klamath	177,575	10,981	654	35,535	320,487	0	545,232
	Coos	232,948	28,608	24,051	190,205	28,681	10,404	514,897
	Curry	44,628	4,827	4,090	11,610	103,380	285	168,820

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[1] Includes volume removed (softwood and hardwood) as logs, poles, and pilings but not volume removed from woodcutting operations.
[2] Compiled by Oregon State Department of Revenue.
[3] Compiled by Bureau of Land Management.
[4] Compiled by United States Forest Service, Region 6.
SOURCE: Oregon Timber Harvest Reports, Oregon State Department of Forestry

Table 3-T-4. Timber Management and Forest Development Accomplishments to October 1, 1991[1]

Practice	Planned to 10-1-91[2]	Accomplished 10-1-91
Josephine SYU		
Target ASQ conifer volume[3]		
MM cubic feet	203.52	170.06
MM board feet (net)	1,040	869
ASQ contributing acres		
Reproduction cut	45,480	26,200
Overstory removal	9,720	7,041
Commercial thinning	6,267	2,700[4]
Prescribed fire[5]	29,601	21,927
Herbicide use	56,040	8,993
Manual vegetation treatment	0	17,953
Brush and hardwood conversion	0	270
Planting[6]		
Standard stock	63,000	38,782
Genetic stock	0	2,865
Animal damage control	0	12,388[7]
Precommercial thinning	20,300	10,898
Fertilization	22,680	6,814
Jackson-Klamath SYUs		
Target ASQ conifer volume[3]		
MM cubic feet	222.99	172.48
MM board feet (net)	1,298	1,004
ASQ contributing acres		
Reproduction cut	37,013	26,250
Overstory removal	27,307	21,152
Commercial thinning	16,240	5,750[4]
Prescribed fire[5]	35,105	23,907
Herbicide use	30,357	3,809
Manual vegetation treatment	0	21,459
Brush and hardwood conversion	0	744
Planting[6]		
Standard stock	52,435	58,459
Genetic stock	0	914
Animal damage control	0	35,733[7]
Precommercial thinning	8,941	10,327
Fertilization	24,731	9,020

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[1] Accomplishments are total achieved October 1979 through September 30, 1991. Includes the Medford District and the Klamath Falls Resource Area.
[2] Reflects program adjustments made by SEIS ROD.
[3] Includes 68 MMBF of fire salvage and 57 MMBF which were the result of insect attacks since 1989.
[4] Includes all nonregeneration partial cuts in commercially thin aged stands.
[5] Includes broadcast burn, hand pile and burn, and tractor pile and burn.
[6] Table 1-1 Adjusted for SEIS revision in harvest acres.
[7] Includes browse protection and gopher baiting/trapping.

Table 3-T-5. Stand Treatment Accomplishments[1]

	Acres				
Age Class	Genetically Selected Stock	Precommercial Thin	Commercial Thin[2]	Overstory Removal	Fertilized
10	4,081	1,062	0	18,269	716
20	0	8,944	0	3,806	6,410
30	0	3,973	0	4,060	2,481
40	0	278	0	2,058	127
50	0	0	634	0	207
60	0	0	1,360	0	822
70	0	0	1,318	0	725
80+	0	0	5,138	0	1,347
Total	**4,081**	**14,257**	**8,540**	**28,193**	**12,835**

[1] Josephine SYU October 1, 1979 through October 1, 1991 and Jackson/Klamath SYU's October 1, 1980 through October 1, 1991, which includes the Medford District and Klamath Falls Resource Area.

[2] This figure represents both commercial thinning and partial cut entries. Site-specific analysis of wild stands considered for commercial thinning indicated many would not yield increased growth if subjected to standard commercial thinning prescriptions. However, many stands contained components which could be removed without depressing long-term yield with entries which had the same objectives as standard commercial thinning. Partial cut entries were conducted which removed these stand components.

reforestation program for the district for the period 1979 to 1988 was 6,350 acres. Funding has been available throughout this period to complete available planting projects. The results of reforestation efforts on lands harvested during the last decade are shown in Figure 3-T-2. Of the 8,599 acres pending reforestation, 1,730 acres were scheduled for initial planting in 1992, 5,164 acres were scheduled to receive interplanting or replanting in 1992, and 1,705 acres were awaiting site preparation and initial planting.

Reforestation activities were completed in conjunction with the experimental harvest of LIM lands. Reforestation success on LIM lands is roughly comparable to reforestation success on suitable commercial forestlands allocated to timber production (see Appendix 3-T-6, Draft RMP).

Prompt planting of timber sale units is a key in achieving successful reforestation. This helps seedlings become established before other vegetation can take over the site. During the past decade, an average of 93 percent of timber sale acreage has been reforested within three years of harvest (see Appendix 3-T-7, Draft RMP).

The delay between the sale of timber and successful reforestation is termed the regeneration period. Within the planning area, the regeneration period ranges from 3.0 years to 4.3 years, depending on harvest type and location. Average regeneration periods by harvest type are: clearcut, 3.2 years; partial cut, 3.5 years; and overstory removal, 3.6 years (see Appendix 3-T-8, Draft RMP). The principal reasons for regeneration period include the delay between timber sale and actual timber harvest and the delay between harvest and the completion of required site preparation. Determination of regeneration period is important because of its effect on the PSQ. Long regeneration periods result in a decrease of the PSQ.

Energy and Mineral Resources

Since 1980, mineral activity on BLM-administered land in the planning area has included small sales of mineral materials from community rock pits and crushed rock for surfacing logging roads in conjunction with timber sales. Other mineral activity includes small placer gold operations, small underground gold operations, exploration drilling, and limestone production for agriculture and the paper industry.

Table 3-T-6. Conifer Volume Sold for Decade and Adjustments

Volume	Million Board Feet
Regulated Volume[1]	
Josephine SYU	
Total volume sold FY 80-91	1,000
Volume bought back	(131)
Net volume sold	869
Support for volume	
Base level	936
Precommercial thinning	77
Fertilization	25
Loss of herbicides	(47)
Total supported volume	991
Surplus of volume supported over volume sold	+ 122 MMBF
Jackson SYU	
Total volume sold FY 81-91	769
Volume bought back	(86)
Net volume sold	683
Support for volume	
Base level	847
Precommercial thinning	90
Fertilization	5
Loss of herbicides	(61)
Total supported volume	881
Surplus of volume supported over volume sold	+ 198 MMBF
Klamath SYU	
Total volume sold FY 81-91	338
Volume bought back	(17)
Net volume sold	321
Support for volume	
Base level	330
Precommercial thinning	21
Fertilization	5
Loss of herbicides	(8)
Total supported volume	348
Surplus of volume supported over volume sold	+ 27 MMBF

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[1] Includes volume bought back by the BLM due to "Buyback" legislation in 1984. [Federal Timber Contract Payment Modification Act of October 16, 1984; (98 Stat. 2213; 1`6 USC 618)] and regulated volume depleted in the previous decade (Josephine pre-FY '90 26 MMBF, Jackson pre-FY '81 63 MMBF, and Klamath pre-FY81 11 MMBF).

NOTE: Negative figures are shown in parenthesis.

Table 3-T-7. Nonregulated Timber Harvest Volume[1]

SYU[4]	(Million board feet)	
	Conifer Sawtimber Volume[2]	Other Volume[3]
Jackson[5]	35	41
Josephine[6]	35	58
Klamath[5]	1	2

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[1] Includes LIM study sale volume.
[2] Nonregulated volume bought back under the Federal Timber Contract Payment Modification Act of October 16, 1986; (98 Stat. 2213; 16 USC 6 18) is not included.
[3] Includes firewood and other nonsawtimber convertible to board feet.
[4] Approximately 38 percent of the conifer volume was the result of wildfire and approximately 13 percent was the result of insect attack since 1989.
[5] Total for the period FY 1981 through 1991.
[6] Total for the period FY 1980 through 1991.

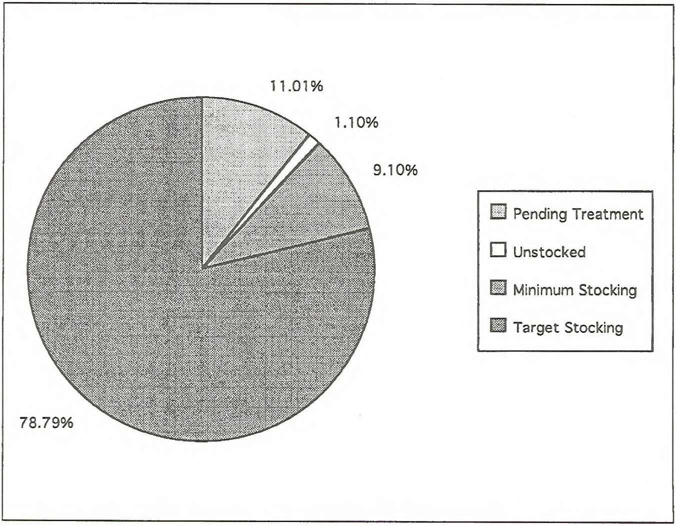

FIGURE 3-T-2. District Average Reforestation Success (not including LIM Acres)

Table 3-T-8. Estimated Hardwood Volume[1] by Species and SYU (000s cubic feet)

Area	Species	Sustained Yield Units
Jackson	Maples	2,726
	Alder	1,630
	Madrone	32,441
	Chinquapin	5,112
	Ash	451
	Tanoak	0
	Oregon White Oak	1,618
	California Black Oak	9,544
Total		53,522
Josephine	Maple	1,938
	Alder	2,950
	Madrone	51,079
	Chinquapin	12,915
	Ash	1,265
	Tanoak	7,462
	Oregon White Oak	537
	California Black Oak	9,650
Total		87,796
Klamath	Maple	0
	Alder	0
	Madrone	0
	Chinquapin	0
	Ash	0
	Tanoak	0
	Oregon White Oak	163
	California Black Oak	352
Total		515
District Total	Maple	4,664
	Alder	4,580
	Madrone	83,520
	Chinquapin	18,027
	Ash	1,716
	Tanoak	7,462
	Oregon White Oak	2,318
	California Black Oak	19,546
Total		141,833

[1] Suitable commercial forestland only.

During the past 10 years, BLM has received 681 notices of intent to mine and 6 plans of operation. Most of these notices have been for placer gold. There have been no notices for exploration of leasable minerals, and no leases have been issued since 1985. Most pre-1980 oil and gas leases have been relinquished or terminated. Five oil and gas leases are still current on 14,465 acres. It is BLM's policy to encourage exploration and development of minerals using environmentally sound practices.

The mineral estate is classified by its potential for the occurrence of valuable minerals including locatable minerals, oil and gas, geothermal, and saleable minerals (see Table 3-EM-1 and Map 3-15). Mineral potential is an assessment of the likelihood of the occurrence of minerals, not an assessment of the development potential of those minerals. The assessment is based on the geologic environment, inferred geologic processes, reported occurrences, geochemical/geophysical data, and known mineral development. In addition, the assessment potential utilizes information provided by the public and mineral industry through nomination of areas of critical mineral potential (ACMP). Fifteen ACMPs have been nominated which cover about 50 percent of the planning area.

There are a variety of mineral deposit types in the planning area hosting numerous metallic and nonmetallic locatable minerals including gold, silver, silica, limestone, cobalt, mercury, copper, zinc, tungsten, fire clay, and nickel. Most placer gold deposits were thoroughly mined at the turn of the century. Gold miners then turned to hard rock mining which focused on free gold in quartz veins. Other types of mineral deposits found in the planning area include massive sulfides in felsic and mafic volcanics, epithermal gold, podiform chromite, and nickel laterite.

As of January 1990, there were approximately 13,000 mining claims, 209 active mining notices, and one plan of operation on file. All mining surface disturbances are managed by federal regulations 43 CFR 3809 and 3802. These regulations were implemented to prevent unnecessary or undue degradation and to require reclamation of lands disturbed by mining operations. Of the 871,914 acres of locatable minerals managed by BLM, all but approximately 18,700 acres are open to mineral entry under the general mining law of 1872.

Leasable minerals in the planning area includes oil, gas, and geothermal resources. Recent U.S. Geological Survey studies suggest there is, in theory, moderate-to-high oil and gas potential in the formation under the Rogue Valley and the Cascade Mountains. All oil and gas leasing has been suspended pending completion of the RMP planning process. Geothermal potential in the planning area is considered low.

Quarry and pit run rock are the primary saleable minerals found in the planning area. During the past decade, average annual rock production from BLM quarries was 350,000 loose cubic yards from 170 active quarries. This has declined in the last five years due to the downturn in the timber industry. Rock from the quarries is used primarily to surface logging roads. BLM manages these rock quarries in accordance with the 43 CFR 3600 regulations which require development and reclamation plans.

Table 3-EM-1. Mineral Potential

Type	Mineral Potential (Acres) Low	Moderate	High	Total
Locatable	473,111	388,675	10,128	871,914
Salable	0	864,798	0	864,798
Leasable (Oil and Gas)	609,421	202,741	52,636	864,798
Leasable (Geothermal)	789,543	75,255	0	864,798

Socioeconomic Conditions

For the socioeconomic section, the planning area equates to Jackson and Josephine counties. Information regarding population, employment, and personal income has been examined to determine the basic structure and scope of the economy in the region. The baseline, 1984-1988, represents average economic conditions that encompasses a period of national growth following the recession of the early 1980s.

Population

Average population during the 1984-1988 baseline period in Jackson and Josephine counties was 139,300 and 61,790, respectively (CPRC 1991). Population has increased since the 1980 census. Ashland and Grants Pass have grown rapidly and population in Medford has been stable. Urban amenities are one attraction, jobs are another. A large number of retirees also are moving to both urban and rural settings.

In Jackson County the estimated population was 146,389 in 1990 census with 41 percent living in unincorporated areas (CPRC 1991). Jackson County's population increased annually throughout the past decade except during 1983. Net migration between 1980 and 1990 is estimated to be 6,615. In Josephine County, the 1990 census estimated population totaled 62,649 with 70 percent living in unincorporated areas (CPRC 1991). Josephine County experienced slight population decreases in 1982, 1985, and 1986, however, net migration into the county (1980-90) is estimated to be 2,427.

Both Jackson and Josephine counties have high percentages of population older than 65 years, 16 percent and 22 percent respectively, compared to the statewide percentage of 14 percent.

Employment

Traditionally, southwestern Oregon has relied on natural resources for employment opportunities (see Table 3-SE-1). Timber, fisheries, agriculture, and tourism provide significant employment. The wood products sector (including paper) is a major employer in the two-county area, employing an average of 7,846 persons (1984-88). Trade (17,626) and government sectors (11,714) also generate significant employment. Employment in the wholesale and retail trade industries grew throughout the baseline period. Employment in the service and government sectors (includes federal, state and local government, and public education) increased during the baseline period.

Recently, employment growth in all sectors has slowed. In 1989 and 1990, employment in the wood products industry decreased significantly. Between July 1988 and September 1991, there were 14 cutbacks or closures in the wood products sector affecting 1,089 jobs or a 13.8 percent reduction in wood products employment. Employment in this economic sector is sensitive to raw material supply and overall economic health. These employment declines are part of a long-term downward trend in the region's timber-related employment. There are many reasons for this trend. Part is due to productivity increases and also to decreases in timber harvest as a result of a hiatus between the depletion of old-growth forests and the growth of regenerated forests to harvestable size (Sample and LeMaster 1992).

Although unemployment trends were similar, decreasing since 1984, unemployment rates in the two counties differed. Unemployment peaked during 1982 at 14.4 percent in Jackson County. Rates steadily declined reaching a low of 6.4 percent in 1987. In 1992, the most recent year available the unemployment rate in Jackson County was 8.4 percent. In the past decade, Josephine County has had higher unemployment rates than neighboring Jackson County. The Josephine County unemployment rate reached a high of 15.2 percent in 1982 declining to a low of 7.2 percent in 1988, and in 1992 unemployment was 10.5 percent.

Personal Income

Personal income indicates wealth in a particular area. Income statistics track both wage and nonwage income sources. Nonwage income of transfer payments, interest, dividends, and rent have become an increasing share of total personal income during the past decade, both nationally and locally. Per capita income in Jackson County averaged $11,955 during the 1984-1988 baseline (see Table 3-SE-2). Josephine County per capita income averaged $9,990. Statewide average per capita income averaged $13,308. This trend has widened in recent years.

Table 3-SE-1. Resident Labor Force, Employment by Industry in Oregon

	1970	1980	1984-88 Average	1989	1990	1991	1992
Civilian Labor Force	864,500	1,295,000	1,362,400	1,475,000	1,491,000	1,508,000	1,537,000
Unemployment	61,700	107,000	104,800	84,000	82,000	90,000	115,000
Total Wage and Salary Emp.	709,200	1,044,600	1,068,680	1,209,400	1,251,900	1,250,800	1,270,900
Total Manufacturing	172,300	215,100	203,240	218,400	220,300	211,700	207,400
Lumber & Wood Products (& Paper)	76,200	79,900	75,060	76,400	73,200	65,800	63,300
Other Manufacturing	96,100	135,200	128,180	142,000	147,100	145,900	144,100
Total Non-Manufacturing	536,900	829,500	865,440	991,000	1,031,600	1,039,000	1,063,500
Const. & Mining	30,800	48,800	35,800	47,600	54,000	53,000	51,100
Trans., Comm. & Utilities	48,700	60,500	58,040	63,100	64,500	65,200	65,500
Trade	162,000	255,600	269,680	305,900	313,100	314,300	320,200
Finance, Ins. & Real Est.	36,000	70,000	69,360	75,900	80,300	83,200	86,000
Services & Misc.	112,700	191,400	231,180	282,900	296,200	296,900	309,900
Government	146,700	203,200	201,360	215,600	223,500	226,400	230,900
Jackson County							
Civilian Labor Force	37,240	63,070	67,136	73,160	73,430	74,820	77,020
Unemployment	3,040	6,510	5,454	4,930	4,950	5,700	6,490
Total Wage and Salary Emp.	26,500	43,500	47,136	53,500	54,840	54,710	56,510
Total Manufacturing	6,010	7,690	8,684	9,230	8,920	8,150	8,660
Lumber & Wood Products	4,570	5,030	5,550	5,790	5,370	4,690	5,100
Other Manufacturing	1,440	2,660	3,134	3,440	3,550	3,460	3,560
Total Non-Manufacturing	20,490	35,810	38,454	44,270	45,920	46,560	47,850
Const. & Mining	810	1,960	1,578	1,980	2,150	2,060	2,070
Trans., Comm. & Utilities	1,590	2,240	2,672	2,890	2,920	2,950	2,840
Trade	6,600	11,890	13,300	15,650	16,160	16,320	16,730
Finance, Ins. & Real Est.	980	2,230	2,320	2,540	2,620	2,660	2,680
Services & Misc.	4,500	8,040	9,872	11,810	12,530	12,910	13,750
Government	6,010	9,450	8,712	9,420	9,530	9,660	9,790
Josephine County							
Civilian Labor Force	13,050	23,790	25,040	27,190	26,510	26,240	27,320
Unemployment	1,340	3,100	2,314	2,110	2,100	2,280	2,880
Total Wage and Salary Emp.	8,820	15,740	16,598	18,620	18,520	17,950	18,460
Total Manufacturing	2,630	3,580	3,964	4,180	3,980	3,620	3,550
Lumber & Wood Products	1,840	2,220	2,296	2,220	2,010	1,670	1,650
Other Manufacturing	790	1,360	1,668	1,960	1,970	1,950	1,900
Total Non-Manufacturing	6,190	12,160	12,636	14,440	14,540	14,330	14,910
Const. & Mining	230	580	430	560	630	600	610
Trans., Comm. & Utilities	400	580	622	740	680	630	660
Trade	2,060	3,830	4,326	5,090	4,990	4,990	5,090
Finance, Ins. & Real Est.	270	850	784	870	900	890	920
Services & Misc.	1,210	2,780	3,478	3,950	4,030	3,990	4,290
Government	2,020	3,540	3,002	3,220	3,310	3,240	3,350

SOURCE: Oregon Employment Division

Local Resources

Within the planning area, but not associated with BLM management activities, are a number of enterprises that attract regional, state, or national attention. These activities have significant impacts on the local economy. The Shakespearean Festival, held annually in Ashland, is nationally known. Jackson and Perkins of Medford supplies rose bushes and other landscaping vegetation and supplies by mail order to customers throughout the United States. The Rogue River valley produces about 10 percent of the nation's pear crop. Medford serves as a medical center to southwestern Oregon and northern California.

Jacksonville, a well-preserved frontier mining community, is one of only three living history districts in the United States and is second to Crater Lake National Park as a recreation destination point in southwestern Oregon. It is home to the popular Britt Music Festival.

The entire southwestern portion of Oregon attracts a large retirement community due to its favorable climate and location. Grants Pass and Josephine County attract a large number of tourists for fishing and recreation use of the Rogue National Wild and Scenic River. It is also a gateway to the Pacific Coast. Communities along the upper Rogue River benefit from tourism based on fishing and recreation use of the Rogue River.

Public Attitudes

Surveys of public attitudes about timber harvest practices indicate disagreement with how and where certain practices are used. This is demonstrated by the increase in local protest and appeals activity which increased from the early to late 1980s.

Both the Oregon State Board of Forestry survey of social attitudes about forest practices (see Table 3-SE-3) and Sturtevant's survey (see Table 3-SE-4) indicate less support for traditional forest management in more urban areas than in more rural areas.

- Sturtevant concluded: This survey shows two distinct groups living in the interface: urban, newer migrants - both retired and younger; and rural, old timers who grew up in or near the interface. The first group most likely grew up in the congestion and pollution common to urban areas and developed a largely symbolic attitude towards the environment (Tremblay and Dunlap 1978), adopting a view of rural lands as a pastoral escape, or the environment as a thing of beauty, that is reinforced by mass media, Sierra Club books, vacations, and wilderness recreations. These people are more accepting of regulation, planning and government intervention and are willing to employ these in preservation of the natural environment. More educated interface residents, whether newcomers or oldtimers, represent these urban values and symbolic approach to environment, taking a more skeptical view of timber harvesting's economic benefits and expressing support for land use planning.

Rural people, in contrast, have a greater kinship with nature. Use of the environment is more regular and taken for granted, often as an integral part of the rural economy. People raised in the interface have had less exposure to the pollution of cities and are less sensitized to possible destruction of the environment; additionally, they show preference for local control and resent outside intervention. They see some environmental degradation as a normal consequence of pursuing a livelihood of rural resources, a necessary part of the production process. Many see themselves as environmentalists, even in their active resource management, and many may be. They express the view that these "newcomers" will learn the utilizer's way of approaching the interface environment, or return to the cities.

The future of timber harvesting in the interface will increasingly be affected by those living in this unique area between cities and forests. Some will wield more political and economic influence than others—in all likelihood, the newer, younger and more highly educated residents. Also, we can expect the numbers of old-timers strongly supporting the timber industry and its current activities to decrease, replaced by a new wave originally urban, self-employed, professional and/or retired residents, either younger or belonging to the aging cohort influenced earlier by the ecology movement. These people have already requested and will continue to request changes in resource management methods in the interface, as well as in surrounding forests, and foresters (in agencies, corporations and as independents) will have to listen to and communicate with them (Sturtevant 1989b).

Table 3-SE-2. Personal Income by Industry, Oregon (thousands)

	1970	1980	1984-88 Average	1989	1990	1991
Total personal income	8,163,400	26,053,992	36,647,682	45,188,249	48,744,661	51,111,885
Population (thousands)	2,100	2,642	2,693	2,791	2,861	2,922
Per capita personal income (dollars)	3,887	9,863	13,598	16,193	17,038	17,495
Farm	235,598	474,419	558,796	887,987	902,618	875,029
Nonfarm	6,191,140	18,903,314	25,431,683	31,599,836	34,259,527	35,858,962
Ag. Serv., For., Fish., and other	45,970	153,099	279,316	354,802	406,179	413,179
Mining	15,256	101,468	48,332	44,598	54,463	62,441
Construction	409,967	1,373,943	1,297,393	1,783,668	2,063,099	2,114,244
Manufacturing	1,579,414	4,749,512	5,809,247	6,969,524	7,204,428	7,340,506
Nondurable goods	406,845	1,073,769	1,401,383	1,650,289	1,769,440	1,869,165
Paper and allied products	98,990	287,975	368,584	414,698	418,696	431,657
Durable goods	1,172,569	3,675,743	4,407,864	5,319,235	5,434,988	5,471,341
Lumber and wood products	641,124	1,684,758	1,962,060	2,182,055	2,087,623	1,962,324
Transportation and public utilities	546,832	1,538,631	2,048,669	2,394,109	2,535,167	2,698,171
Wholesale trade	440,505	1,436,555	1,823,268	2,333,046	2,527,784	2,626,699
Retail trade	795,358	2,235,839	3,044,078	3,668,902	3,950,646	4,190,681
Finance, Ins., and Real Estate	304,149	1,000,050	1,269,971	1,545,520	1,710,894	1,753,013
Services	944,887	3,328,738	5,519,321	7,324,212	8,175,474	8,612,905
Government and government enterprises	1,108,802	2,985,479	4,292,088	5,181,455	5,631,393	6,047,123
Federal, civilian	262,232	609,044	849,918	1,025,116	1,127,937	1,171,540
Military	35,662	67,919	116,768	128,780	136,391	140,620
State and local	810,908	2,308,516	3,325,402	4,027,559	4,367,065	4,734,963
Jackson County (thousands)						
Total personal income	316,062	1,158,381	1,722,013	2,118,248	2,296,049	2,407,494
Population (thousands)	95.4	133	136.82	143.4	147.5	150.9
Per capita personal income (dollars)	3,314	8,713	12,570	14,772	15,570	15,953
Farm	6,123	21,946	18,252	21,864	18,644	23,215
Nonfarm	219,366	756,522	1,082,476	1,320,528	1,428,950	1,477,174
Ag. Serv., For., Fish, and other	2,843	5,737	9,998	12,855	13,529	14,801
Mining	397	4,470	2,244	2,446	2,106	2,145
Construction	13,745	61,832	64,160	76,987	86,309	84,981
Manufacturing	56,690	167,261	239,889	273,615	267,160	250,042
Nondurable goods	7,202	25,365	34,421	39,937	44,411	45,512
Paper and allied products	(D)	(D)	(D)	(D)	(D)	(D)
Durable goods	49,488	141,896	205,468	233,678	222,749	204,530
Lumber and wood products	43,855	119,096	168,732	186,940	172,796	156,275
Transportation and public utilities	18,377	58,857	94,170	115,444	131,566	141,232
Wholesale trade	12,541	47,336	47,632	58,515	75,344	80,254
Retail trade	33,243	114,103	172,110	201,215	223,417	234,454
Finance, Ins., and Real Estate	7,919	28,641	35,410	46,104	49,920	47,273
Services	33,044	137,821	239,830	316,764	346,870	373,637
Government and government enterprises	40,567	130,464	177,034	216,583	232,729	248,355
Federal, civilian	10,061	33,959	44,251	53,483	59,536	61,053
Military	842	1,679	3,862	4,484	4,769	4,872
State and local	29,664	94,826	128,920	158,616	168,424	182,430

Table 3-SE-2. Personal Income by Industry, Oregon (thousands) (continued)

	1970	1980	1984-88 Average	1989	1990	1991
Josephine County (thousands)						
Total personal income	119,419	454,836	683,228	823,256	873,437	906,045
Population (thousands)	36.3	59.2	60	61.8	63	64.7
Per capita personal income (dollars)	3,289	7,679	11,380	13,321	13,872	14,004
Farm	1,660	4,318	2,313	3,234	3,458	3,187
Nonfarm	77,057	258,119	349,532	431,296	448,926	448,032
Ag. Serv., For., Fish, and other	673	1,857	3,075	4,142	5,403	5,487
Mining	441	1,933	1,260	1,981	2,355	1,682
Construction	4,555	19,887	20,743	27,189	28,963	28,693
Manufacturing	22,233	69,310	96,806	110,212	104,693	94,879
Nondurable goods	1,952	6,283	6,858	8,858	9,455	9,659
Paper and allied products	251	0	0	0	0	0
Durable goods	20,281	63,027	89,948	101,354	95,238	85,220
Lumber and wood products	16,661	50,091	63,569	66,164	58,050	48,955
Transportation and public utilities	5,169	15,712	20,079	23,689	25,480	25,577
Wholesale trade	2,205	5,649	8,291	11,782	11,321	12,690
Retail trade	13,582	42,322	57,625	74,045	77,036	81,230
Finance, Ins., and Real Estate	2,214	9,236	8,569	9,938	11,876	9,696
Services	11,303	47,245	76,574	99,083	106,158	109,622
Government and government enterprises	14,682	44,968	56,511	69,235	75,641	78,476
Federal, civilian	2,562	6,491	10,086	12,899	14,975	14,588
Military	268	738	1,614	1,847	1,948	1,963
State and local	11,852	37,739	44,811	54,489	58,718	61,925

Source: Bureau of Economic Analysis, Regional Economic Analysis System. 1993.

Oregon State Economic Development Department Activities

Timber supply and timber product markets have great impact on regional and local economies. The most visibly affected communities are those where timber-related industries are the only or primary sources of employment and income. This occurs most frequently in the small, outlying towns beyond a reasonable commuting distance from Medford or Grants Pass where more diversification has occurred. The State of Oregon has identified 10 communities and Douglas County within the planning area as severely affected areas. These areas are eligible for additional state assistance through the Oregon Economic Development Department (OEDD) and Oregon's Coordinated Timber Response Program. Identified communities are as follows: Butte Falls, Central Point, Medford, Prospect, White City, Cave Junction, Kerby, Merlin, Selma, and Williams.

An Oregon State University extension service publication examined these and other communities within Oregon. Using Census data for 1980 and 1990 the report found that these timber dependent communities lagged behind nontimber dependent communities. On average, these communities experienced no population growth, declining median household income, higher unemployment and poverty rates, and lower educational attainment (Seidel 1993).

Early recognition of the severity of the economic plight of the outlying towns caused OEDD to institute pilot programs of assisting towns by helping them assess their capabilities and opportunities to diversify local employment and income. Butte Falls and Cave

Table 3-SE-3. Support of Forest Management Practice by Geographic Location in Oregon

(Percent strongly support/oppose only)

	Total	Portland Metro	Willamette Valley	South	Coast	East
Harvesting old growth timber	37/15	33/18	35/17	41/08	40/13	48/09
Slash burning	25/18	25/18	21/21	26/18	23/15	32/12
Clear cutting	15/40	13/41	16/38	11/42	26/28	15/48
Spraying herbicides	26/17	20/19	30/13	30/15	21/16	38/13
Export of logs	27/30	28/25	27/32	28/27	19/40	26/36
Setting aside areas with no roads and harvesting	34/18	42/12	31/14	20/30	23/19	35/32
Timber harvesting in watersheds	13/32	13/39	07/32	16/15	15/30	26/25

SOURCE: Moore Information Inc. 1989

Table 3-SE-4. Jackson County Rural Interface Area Residents' Attitudes About Forest Practices

	V[1]	S[1]	M[1]	N[1]
Slash burning	22	30	34	14
Herbicide use	42	19	25	14
Soil erosion	39	32	23	06
Traffic/noise/dust	12	26	43	19
Decreased aesthetics	28	29	33	10
Clearcutting	54	16	16	15
Wildlife habitat degradation	38	23	23	16
Reduced water quality and quantity	50	21	23	5
Mining	18	26	29	26
Grazing	8	18	37	37
Tourist traffic	10	25	42	43
Population increase	21	40	24	15
Planning restrictions	29	27	27	15

[1] V: Very serious
S: Serious
M: Minor problem
N: No problem
SOURCE: Sturtevant 1989b

Junction are the two pilot program towns in southwestern Oregon. They have completed their assessments and prepared strategic economic development plans. Some state funds have been available to each community as part of the process. Both programs are viewed as highly successful. The communities are organized and pursuing their goals. Key partners in the process are the towns' common neighbors: the BLM, Forest Service, counties, and neighboring towns. These agencies continue to be involved with the efforts to diversify incomes and increase employment to help replace those lost due to loss of employment in the timber industry.

The first economic development priority in both cities was to capture more of the recreation market. In both instances the communities are bound by government agencies or private corporation holdings. Butte Falls has expanded its recreation planning to coordinate with Prospect, Trail, Eagle Point, and Shady Cove to develop supportive recreation programs.

BLM Economic Contribution

BLM-administered lands in the planning area make significant contributions to local economies. Timber harvest from public lands supply local mills and commercial and sport fisheries depend upon fish reared in stream reaches managed by BLM. Tourists bring new dollars into local communities. Counties receive payments from BLM in accordance with a variety of current laws. For planning purposes, an input-output model (BLMPACT) was developed to facilitate estimates of economic impacts of BLM management on local economies for each BLM district and western Oregon as a whole.

Timber

BLM managed 444,372 acres of forestland allocated for timber production in the planning area during the period 1984-1988. The average annual harvest from this land during 1984-1988 totaled 237,507 mbf or approximately 27 percent of all harvest from all ownerships in the two-county region. Forest Service harvests totaled 39 percent of all harvests and private industrial harvests were 31 percent. The remaining three percent was harvested from state, other public, and nonindustrial private land. The average annual harvest from BLM-administered land is estimated to contribute 1,280 jobs in the timber industry and $34.79 million in direct local personal income. Respending effects added 960 jobs in other sectors and $14.35 million in local personal income. BLM timber sales have been halted by court injunction. Harvest of sales previously sold remaining under contract continued to provide jobs and income in the region through 1993. No significant volumes remain under contract as of 1994.

Tourism

Economic impacts occur when visitors from out of the region make purchases in the local economy. These "new" dollars create jobs and enhance personal income. Recreation spending by local residents is not influenced by the provision of recreation opportunities on BLM-administered land. BLM estimates a total of 282,100 annual visits were made to BLM-administered land in the planning area by nonresidents. Input-output analysis suggests that spending by these nonresidents generated 172 direct jobs and $1.79 million in local personal income. Respending effects added 93 jobs and $1.35 million in local personal income.

Grazing

There are 101 allotments on 352,312 acres in the planning area. Average active preference during the baseline period totalled 16,472 animal unit months (AUMs). These permits directly contributed about $1.5 million to agricultural output (gross agricultural sales) (Hewlett 1987; BLMPACT). In the two-county region, total agricultural output during the baseline period averaged almost $60.3 million. Livestock grazing on BLM-administered land contributed an estimated 14 jobs and $90,800 in direct personal income. Respending effects added 18 jobs and $233,600 in local personal income.

Fisheries

It is estimated that the Rogue River and Cow Creek basins annually produce an average of about 254,000 wild salmon and steelhead trout to regional sport and commercial fisheries (Satterthwaite 1991; Anglin 1992). The extent wild resident trout contribute to sport fishing in the planning area is unknown.

The Rogue River basin is the largest producer of summer and winter steelhead trout in Oregon, except for the Columbia River. The catch of summer steelhead may be the largest among all rivers in the state (Satterthwaite 1989). The South Umpqua, of which Cow Creek is a tributary, also is a major contributor of winter steelhead.

Populations of Rogue River spring and fall chinook salmon are the largest of all Oregon coastal rivers (except the Columbia River) and contributed about one-third of the state's commercial catch during 1979-86 (Nicholas and Hankin 1988). The Rogue basin supports Oregon's largest recreational fishery for spring chinook salmon and one of the more important fisheries for fall chinook salmon.

Cow Creek's fall chinook salmon contribute to the state's commercial and recreational fisheries and are important for maintaining long-term genetic diversity of the South Umpqua River's chinook populations.

Economic benefits of producing wild fish on public land accrue to commercial fishermen and river fishing guides as well as tackle and bait shops, restaurants, motels, and the boat manufacturing industry. There is an inherent, intrinsic value to populations of wild fish.

An interagency effort to determine the economic value of the Rogue River basin's anadromous and resident trout fisheries is in progress. A final report is scheduled for release in early 1994. Currently little information is available.

Mining

Mineral production makes up only a small part of the total economic picture in the planning area. While mining was once the principal source of income for southwestern Oregon, it has remained relatively insignificant since World War II.

Within the planning area, there are no known deposits of leasable minerals of significant interest. There are no deposits of leasable minerals currently in production. There are numerous small gold mining operations but only minor interest by larger mining companies. No data is available to assess the economic contribution of locatable minerals to the local economy.

Nonmetallic industrial minerals such as quarry rock and clay have the largest economic impact. There are 170 quarries on BLM-administered land and one developed clay pit. Five quarries are used commercially while the remainder are used by federal, state, or local agencies. BLM's free-use permit system directly assists local communities and localities. Most rock taken from BLM quarries is used for BLM timber sale roads. The average annual value of rock produced from BLM quarries and placed on roads from 1984 through 1991 is $1.5 million.

Special Forest Products

Special forest products are located throughout the district. Numerous plant species are harvested for personal and commercial use. A partial listing of existing or potential special forest products and their uses are found in Table 3-SFP-1. Although qualitative information exists for many special forest products, quantitative information is not available for many of them. Inventories of special forest products have not been done. The forest stand exam inventory data currently being collected in the district contains elements that document the occurrence of some special forest products.

Documentation of these products occurs when they are harvested under permit. Those that have been sold for harvesting under permit between Fiscal Year '87 and Fiscal Year '91 in the Medford District are shown in Table 3-SFP-2.

Special forest products are legally removed from the forest through the use of permits or without permit for certain amounts of specific special forest products under sections from 43 CFR 5500 and/or 8365.

BLM Payments to County and State Governments

Fifty percent of the total revenue generated by timber sales on O&C lands is distributed to western Oregon counties by a formula based on the amount of O&C lands within each county. Average payments to Jackson and Josephine counties (1984-1988) were $9.8 million and $7.6 million, respectively. The O&C payments directly enter the county general fund and can be spent without restriction. In some counties this is a substantial portion of the general fund. In recent years, annual legislation has provided for additional "safety net" payments to the counties. These payments guarantee revenue streams at levels slightly less than receipts in past years. These "safety net" payments have mitigated a large portion of the county revenue impacts of reduced BLM harvest under the recent court injunctions. Examination of payments on a per capita basis is useful to show the relative importance of payments in each county. The 1984-1988 average per capita payments were $84 million and $146 million in Jackson and Josephine counties, respectively.

The impacts of Ballot Measure 5 property tax limitation are independent of federal taxation, spending, revenue sharing or land management.

Table 3-SFP-1. Partial Listing of Existing or Potential Special Forest Products[1] and their Possible Uses on the Medford District

Existing/Potential Special Forest Products	CR	CO	FL	FU	FO	GR	LP	PH	PO
Skunk cabbage								X	
Western Solomon's plume			X						
Common cattail	X		X		X	X		X	
False-hellebore								X	
Beargrass	X					X		X	
Lady fern						X	X		
Deer fern						X	X		
Mountain-holly fern							X		
Parsley-fern					X		X		
Common sword fern						X	X		
Western bracken fern[2]						X			
Leatherleaf fern							X		
Poison-oak[2]								X	
Himalaya blackberry					X			X	
Evergreen blackberry					X				
Trailing blackberry					X				
Wild cucumber								X	
Wintergreen salal							X		X
Evergreen-huckleberry					X	X	X		
Western red huckleberry					X		X		X
Ground or Vine maple moss						X		X	
Foxglove[2]								X	
Yarrow			X		X	X	X	X	X
Salal	X		X		X	X		X	
Ocean spray			X						
Bayberry			X					X	
Woodland beardtongue							X		
Oregon boxwood						X	X		
Yellow-rose cinquefoil							X		
Pacific ninebark			X						
Spreading phlox							X		
Cascara								X	
Fragrant black currant					X			X	X
Fuschia-flowered gooseberry					X		X	X	X
Redflowering currant							X		
Blackcaps					X		X		
Thimbleberry					X			X	
Salmonberry					X				
Blue elder					X			X	
Red elder								X	
Orange elder								X	
Wood-sorrel					X		X		
Goldenrod					X		X	X	
Vine maple	X			X		X	X		
Manzanita						X	X		
Large Oregon grape	X				X		X	X	
Dwarf Oregon grape	X				X	X	X	X	
Golden chinquapin				X		X	X		

Table 3-SFP-1. Partial Listing of Existing or Potential Special Forest Products[1] and their Possible Uses on the Medford District (continued)

Existing/Potential Special Forest Products	CR	CO	FL	FU	FO	GR	LP	PH	PO
Prince's pine						X	X	X	
American ginger					X		X		X
St. John's wort								X	
Yellow monkeyflower							X		
Incense-cedar				X		X	X		X
Port-Orford cedar				X		X	X		X
Alaska yellow cedar				X		X	X		X
Western red cedar				X		X	X		X
Western white pine		X		X		X	X	X	
Sugar pine	X	X		X	X		X	X	
Ponderosa pine	X	X		X			X	X	
Western hemlock		X		X			X	X	
Red alder	X	X		X	X	X	X		
Pacific dogwood	X			X	X		X		
Oregon white oak	X			X			X		
Willow	X				X		X	X	
Douglas-fir		X		X		X	X	X	X

[1] There are no standards for common names. Depending on the area, a common name may represent different plants.
[2] May be poisonous in some forms to humans.
CO: Cones
CR: Crafts
FL: Floral
FO: Food resource
FU: Fuels
GR: Greenery
LP: Live plants
PH: Pharmaceutical
PO: Potpourri

However, it is an important economic condition that is influencing county funding in western Oregon. In general, urbanized counties in western Oregon have reduced tax rates to comply with the law. Most rural counties are at or approaching the maximum permitted tax rates. For this reason it is generally accepted that western Oregon counties may be unable to generate additional or substitute revenue through property tax rate increases if revenue from federal and other sources declines.

The counties also receive payments in lieu of taxes (PILT) from BLM for a variety of federally-managed lands. BLM administers the entire PILT fund which covers national forests, national parks, federal water projects, Army Corps of Engineers dredge disposal areas, some national wildlife refuges, and some military installations. These annual payments of $.75 per acre, subject to a per capita ceiling, are reduced to a minimum of $.10 per acre when other revenue-sharing activities make equivalent payments. In western Oregon, each county receives the minimum payment. During the baseline period, Jackson and Josephine counties received average annual payments of $45,600 and $34,242 respectively. Payments of $46,717 and $34,938 were made to Jackson and Josephine counties during Fiscal Year 1992. These payments are not expected to change significantly under any foreseeable BLM-management strategies.

As a legacy of the United States General Land Office, the BLM manages former homestead lands. Additionally, approximately five percent of the revenues generated by public domain lands are dispersed through the state to the counties based on

Table 3-SFP-2. List of Special Forest Products Sold under Permit and Their Value, Medford District FY 1987-FY 1991

Product	Unit of Measure	Permits issued FY87-FY91	Amount Sold FY87-FY91	Total Value of Permits ($)
Sawtimber (exclusive of timber sales)	MBF	430	3,134.63	316,665.58
Pulpwood	MBF	85	1,979.94	52,396.47
Marginal logs	MBF	5	20.00	620.00
Bolts and shakes	MBF	1	1.00	96.00
Arrow stock	MBF	0	0.00	0.00
Corral poles	MBF	70	63.47	2,337.71
Small poles	MBF	70	192.96	2,299.84
Large poles	MBF	12	20.76	628.11
Split rails	MBF	4	5.00	147.60
Line posts	MBF	21	16.54	570.10
Corner posts	MBF	10	4.36	222.00
Subtotal-Measured in MBF		708	5,438.66	375,983.41
Fuelwood	Cords	15,468	42,048	216,302.90
Subtotal-Measured in cords		15,468	42,048	216,302.90
Cones	Bushels	6	547	87.00
Subtotal-Measures in bushels		6	547	87.00
Christmas trees	Number	6,251	18,875	38,198.00
Wildings[1]	Number	13	1,066	147.00
Subtotal-Measured individually		6,264	19,941	38,345.00
Cascara bark	Pounds	1	500	10.00
Moss	Pounds	0	0	0.00
Boughs	Pounds	113	204,393	5,748.76
Herbs	Pounds	7	2,695	69.40
Mushrooms	Pounds	8	280	140.00
Burls	Pounds	23	56,184	5,110.40
Subtotal-Measured in pounds		152	264,052	11,078.56
Huckleberry brush	Bundles	29	14,112	468.63
Ferns	Bundles	0	0	14.00
Beargrass	Bundles	71	38,153	1,885.15
Greens[2]	Bundles	9	2,688	129.00
Subtotal-Measured in bundles		109	54,953	2,496.78
	Total	—	22,707	— $ 644,293.65

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[1] Wildings are plants that are sold as transplants.

[2] Greens include many SFP species that are used in crafts and floral designs.

Pacific yew is currently being managed as a separate program.

Table 3-SE-5. Forest Products Harvest Tax Rates Applicable to BLM Timber Purchasers ($/MBF Scribner Long Log)

Period	Forest Practices Act	Forest Research Lab	Emercency Fire Fund	Forest Research Institute	Industrial Fire Prevention	Total Tax Rate
7/1/83-6/30/85	$0.12	$0.23	$0.15	$0.00	$0.00	$0.50
7/1/85-6/30/86	0.10	0.21	0.00	0.00	0.00	0.31
7/1/86-6/30/89	0.10	0.21	0.15	0.00	0.00	0.46
7/1/89-6/30/91	0.16	0.21	0.30	0.00	0.00	0.67
7/1/91-6/30/93	0.39	0.30	0.50	0.31	0.14	1.64
7/1/93-12/31/94	0.56	0.40	0.66	0.31	0.21	2.14

SOURCE: Oregon Department of Revenue. Personal Communication, Rick Schaek. July 1991. Personal Communication, Gwen Gilcrest. October 1993.

total land area of the county. The counties must use these monies for roads and bridges. During the baseline period average payment to the state was $329,905 (BLM Facts). The 1992 Fiscal Year payment was $895,332.

The State of Oregon collects a forest products harvest tax on every thousand board feet (mbf) of timber harvested to fund forest improvement and protection. Forest research, the activities of the Forest Practices Act, and emergency fire control are funded by this tax. Purchasers of all timber, including BLM timber, pay this tax. Tax rates have increased significantly (see Table 3-SE-5).

Community Stability

The national recession, felt locally, may indicate the social and economic impacts that could be expected if BLM-management plans were to have an adverse impact on local economies. Employment losses during 1989, 1990, and 1991 occurred in all sectors of Oregon's economy including electronics, wholesale and retail trade, manufacturing, and lumber and wood products. Of these, BLM management is most likely to affect the lumber and wood products sector. Timber sales from USFS and BLM-managed land have been substantially lower than historic levels and harvest levels have declined since the baseline period.

Impacts of these reduced harvest levels are occurring against a background of change in the lumber and wood products sector including:

- decreasing labor intensity,
- increasing use of smaller diameter logs,
- increased competition and specialization,
- expanding of international markets for wood products,
- increasing use of substitute building materials,
- expanding use of Oriented Strand Board, and
- increasing production and use of laminates and engineered wood products.

Within the planning area, BLM historically supplied 30 percent of timber harvested. Portions of the Siskiyou, Rogue River, and the Umpqua national forests are encompassed within the planning area. Boise Cascade and Medco are the major industrial forest owners in the area.

Timber dependence in the region, measured by lumber and wood products employment as a percent of total employment in the area, has been decreasing. As a portion of personal income, lumber and wood products has decreased. Demographic data shows population is becoming more concentrated in the incorporated areas of Ashland, Medford, and Grants Pass. Thus, sources of employment and personal income are concentrating in those areas. Population in the unincorporated areas has been increasing although at a slower rate.

Given this, it is likely personal income and employment are not increasing in the rural areas of the district. Communities in these rural areas typically have one or two large manufacturing employers, usually timber related. Employment options in these communities are severely limited. Employment options are further limited by the distance from major trade centers.

In Jackson County, BLM payments were 19 percent of the total county expenditures during Fiscal Year 1990-1991. The county general fund received 54 percent of its budget from BLM payments to the county. Federal (BLM & USFS) timber revenues were 26 percent of the total county expenditures. In Josephine County, BLM payments were 31 percent of the total county expenditures during Fiscal Year 1990-1991. The county general fund received 52 percent of its budget from BLM payments. Federal timber revenues were 36 percent of total county expenditures (Lee et al. 1991).

The counties and communities in the planning area depend on timber. Changes in the structure and size of the timber industry are causing substantial economic and social impacts. Social impacts associated with these recent economic dislocations include unemployment, loss of income, and increased need for social services. Out-migration from particularly distressed areas is occurring.

Rural Interface Areas

The rural interface area (RIA) issue concerns BLM's close neighbors and how they feel about forest management close to their property. A related issue is the building national controversy over the use of BLM-administered land within the planning area. While there is overlap, the RIA issue is not about local, regional, or national environmental and industrial organizations' broad concerns about BLM land use management.

The RIA issue is generally driven by BLM neighbors feeling that timber management, grazing, and mining jeopardize their viewshed, open space, domestic water sources, or other aspects of their neighborhood environment (see Appendix 3-RIA-1, Draft RMP). In turn, BLM desires to resolve or minimize future controversy over land management decisions by analyzing the impacts of mitigating RIA residents' concerns. These concerns have been expressed by protests, appeals, and civil litigation (see Table 3-RIA-1).

Local Government and Federal Land Use Plan

County governments in southwestern Oregon have planned and zoned lands intermingled with BLM-administered land as "rural residential" or "farm/forest." Rural residential lands are lands zoned for residential living including certain "exception lands" (OAR 660, Division 4). Farm/forestlands are areas

Table 3-RIA-1. Protests and Appeals by Analytical Watershed[1]

Analytical Watershed[2]	Protests	Appeals
Cow Creek-Galesville	1	0
Cow Creek-Glendale	12	5
West Fork Cow Creek	4	3
Lost Creek	5	3
Big Butte Creek	3	1
Elk Creek	3	2
Rogue-Trail Creek	3	2
Little Butte Creek	1	1
Bear Creek	7	3
Rogue-Gold Hill	5	4
Evans Creek	8	7
Rogue-Grants Pass	0	0
Upper Applegate	2	1
Little Applegate	8	7
Middle Applegate	16	11
Williams Creek	15	11
Lower Applegate	0	0
Rogue Rec Section	2	2
Jumpoff Joe Creek	5	1
Grave Creek	11	6
Rogue-Wild Section	10	6
Upper Illinois	3	3
Deer Creek	2	2
North Fork Silver Creek	0	0
Jenny Creek	10	5
Camp Creek	0	0
Cottonwood Creek	0	0
Total	**136**	**86**

[1] Number of protests and appeals against BLM-management activities (see Appendix 3-RIA-1, Draft RMP) from the date of the record of decisions for BLM's present land use plans to April 1990 (USDI, BLM, MDO 1979 and 1980). It is not necessarily the number of actions expressed only by residents of the private RIAs in those watersheds; there is not a one-to-one relationship between a management action (i.e., timber sale) and protest or appeal. Often one management activity will receive more than one protest or appeal.

[2] See Appendix T for explanation of analytical watersheds.

zoned to protect commercial farm and forestland in accordance with Oregon Department of Land Conservation and Development planning goals 3 and 4. In the rural residential zones, minimum allowable lot sizes range from 1 to 5 acres. In the farm/forest zones, minimum allowable lot sizes range from 6 to 20 acres. Single-family dwellings are allowed outright in the 1 to 5 acre zones and with conditions in the 6 to 20 acre zones.

County land use planning efforts in Oregon have included federal lands in comprehensive planning and zoning ordinances. Generally, counties have recognized the needs of federal resource management and have zoned federal lands to reflect the goals and objectives of federal agencies.

Large minimum lot size zoning on private land adjacent to federal land seems to be an attempt to buffer BLM management activities. Large minimum lot sizes limit residential development and encourage timber or farming activities in the farm/forest zones. Minimum lot sizes for forestry zones in southwestern Oregon range from 20 to 160 acres. This range reflects production capability from poor to good sites with lower site lands having minimum lot sizes from 20 to 40 acres.

Local and BLM planning efforts have inadvertently created an interface of private residential use adjacent to intensively managed forestlands. Counties' attempts to buffer this interface with large minimum lot sizes has, in large part, been unsuccessful in facilitating timber production and other land management activities.

RIA Inventory

The areas where rural residential and/or farm/forest zoning occur near BLM-administered land have been labeled RIAs. Private RIAs are defined as private land zoned for rural-residential or farm/forest 1/2-mile from adjoining BLM-administered land. Public RIAs are defined as BLM-administered land 1/2-mile from the land zoned for rural, rural-residential, or farm/forest (see Maps 3-16 and 3-17 and Appendix 3-RIA-1, Draft RMP. Map 3-17 illustrates the relationship between public and private RIA for the Williams analytical watershed.).

More than 500,000 acres in the planning area have been inventoried as RIA lands, 220,084 acres are private RIA lands (43 percent), and 292,096 are public RIA lands (57 percent).

The process to identify potential RIAs included the distance between existing/potential residences and the classification (i.e., commercial forestland or other TPCC category) of adjacent BLM-administered land. Analytical watersheds were used to analyze the RIA issue because the geography of a watershed relates closely to the design and development of transportation systems, visual resources, grazing allotments, and hydrologic networks. For this document, 27 analytical watersheds were used to compare RIA patterns (see Table 3-RIA-2 and Map 3-3).

Private RIA

An assumption behind the RIA issue is the number of residences or potential residences near BLM-administered land that can be used as a measure of the degree of potential conflict between residential living and forestry practices. Low density populations are less likely than high density populations to object to more intensive land management practices. There are 68,786 acres of private land within one-half mile of BLM-administered land with rural residential use zoning which allows for creating lots as small as 1 to 5 acres. This represents a potential maximum of approximately 27,500 residences adjacent to BLM-administered land.

There are 151,298 acres of private land zoned for lots as small as 6 to 20 acres within one-half mile of BLM-administered land. This represents a potential maximum of approximately 7,500 residences adjacent to BLM-administered land.

The total land open for potential residences in the private RIA is 220,084 acres (approximately 35,000 residences). The number of acres for potential residences also varies by county and resource area (see Table 3-RIA-3 and Appendix 3-RIA-1, Draft RMP).

In December 1992, the Land Conservation and Development Commission (LCDC) passed a set of Oregon Administrative Rules (OARs) to address the "secondary lands" issue. The new term for these lands is small-scale resource lands. Part of the package included a revision to the OARs for Goal 4, the forestlands. The new OARs set out how small-scale resource lands were to be defined using development patterns, soils, and forest site classes.

For example, in Josephine County the small-scale resource lands' proposal will primarily affect lands which are currently zoned as woodlot resource and

Table 3-RIA-2. Private and Public Rural Interface Areas by Analytical Watershed

			Public RIA Lands			
	Private RIA Acres Within 1/2 Mile of BLM-administered land		Suitable Commercial Forestland Within 1/4 Mile of Private RIA[3]		Suitable Commercial Forestland Within 1/2 Mile of Private RIA[3]	
Analytical Watershed[1]	Lands Zoned in 1-5 Acre Lots[2]	Lands Zoned in 6-20 Acre Lots[2]	From Lands Zoned in 1-5 Acre Lots[2]	From Lands Zoned in 6-20 Acre Lots[2]	From Lands Zoned in 1-5 Acre Lots[2]	From Lands Zoned in 6-20 Lots[2]
Bear Creek	1,203	6,093	299	1,720	250	1,561
Big Butte Creek	293	6,123	162	1,162	473	1,109
Camp Creek	0	1	0	0	0	1
Cottonwood Creek	0	2,906	0	204	0	239
Cow Creek-Galesville	0	0	0	0	0	0
Cow Creek-Glendale	1,121	595	447	647	1,758	1,069
Deer Creek	2,764	4,439	1,631	2,134	1,898	2,700
Elk Creek	78	3,510	1	798	22872	
Evans Creek	2,672	11,018	872	6,076	1,776	4,867
Grave Creek	1,848	6,845	707	5,068	1,969	5,098
Jenny Creek	0	3,507	0	2,565	0	3,049
Jumpoff-Joe Creek	9,706	10,842	1,216	5,052	1,714	2,635
Little Applegate	222	4,216	310	2,854	604	2,580
Little Butte Creek	758	9,041	40	1,915		
Lost Creek	462	3,668	92	639	32	1,622
Lower Applegate	9,749	8,020	2,271	2,645	122	650
Middle Applegate	1,622	9,376	1,100	7,621	2,326	2,405
North Fork Silver Creek	0	0	0	0	0	0
Rogue-Gold Hill	3,987	17,743	1,049	8,815	2,067	5,056
Rogue-Grants Pass	13,293	6,311	3,155	3,916	1,603	2,510
Rogue-Recreation Section	4,029	2,325	1,842	1,818	1,406	1,560
Rogue-Wild Section	0	0	0	0	0	0
Upper Applegate	318	393	322	421	512	830
Upper Illinois	8,641	14,120	2,236	4,783	2,113	3,389
West Fork Cow Creek	0	0	0	0	0	0
Williams Creek	2,756	4,606	841	3,027	1,241	2,603
Total	**68,210**	**147,821**	**18,690**	**65,536**	**24,930**	**54,771**

[1] For analytical purposes, watersheds are used to estimate the geographical unit or RIA unit. These watersheds are identical to the analytical watersheds described in the water resources section.
[2] County zones describing 1-5 acre and 6-20 acre lots are described in Appendix 3-RIA-1, Draft RMP.
[3] BLM-administered land inventoried through the TPCC process as suitable commercial forestland and within one-quarter mile of identified county zones (see Appendix 3-RIA-2, Draft RMP).

clustered near exception areas and areas zoned woodlot resource that are divided into parcels less than 40 acres. The proposal in Josephine County may open up lands for development near BLM areas, but an exact number of lots or people has not been determined. Because of the controversy over some of the provisions in the OARs, the 1993 Oregon Legislature is testing some new methods for defining small-scale resource lands. Josephine County has been applying the different criteria on several test areas. The results will be reviewed by several different Oregon State agencies and several other organizations. A decision on whether Josephine County will implement small-scale resource lands has not been made.

In conclusion, it is unknown what, if any, effect the small-scale resource lands proposal will have on BLM's methodology for estimating potential neighbors or residences adjacent to BLM-administered lands.

Public RIA

BLM-administered land comprises the public RIA. The amount is an indication of land management activities potentially occurring adjacent to private RIAs. There are 292,096 acres defined as public RIA.

More than 165,000 acres (57 percent) of the public RIA are inventoried as suitable commercial forestland. These are potential intensive forest management acres with the potential for conflict with adjacent residents.

Conflict is a function of distance. Or, the closer people live to land where intensive management practices occur, the greater the potential for conflict. A potential maximum of approximately 35,000 residences occurs within one-half-mile of BLM-administered land. This build-out is approximately 19,000 residences within one-quarter-mile of BLM-administered land.

Neighborhood Attitudes and Concerns

Attitudes of RIA residents are shifting as emigrants are replaced by an even larger number of immigrants. In many ways the attitudes reflect less emphasis given to commodity production and more associated with the environmental setting.

Table 3-RIA-3. Private and Public Rural Interface Areas by County and Resource Area

	Private RIA Acres within 1/2 Mile of BLM-administered Land		Public RIA Lands											
			BLM Lands Within 1/4 Mile of Private RIA		BLM Lands Between 1/4 and 1/2 Mile of Private RIA		Total BLM Lands Within 1/2 Mile Of Private RIA		Suitable Commercial Forestland Within 1/4 Mile of Private RIA[1]		BLM Lands Between 1/4 and 1/2 Mile of Private RIA		Total BLM Lands Within 1/2 Mile Of Private RIA[1]	
	Lands Zones In 1-5 Acre Lots[2]	Lands Zoned In 6-20 Acre Lots[2]	Lands Zoned In 1-5 Acre Lots[2]	Lands Zoned In 6-20 Acre Lots[2]	Lands Zoned In 1-5 Acre Lots[2]	Lands Zoned In 6-20 Acre Lots[2]	Lands Zoned In 1-5 Acre Lots[2]	Lands Zoned In 6-20 Acre Lots[2]	Lands Zoned In 1-5 Acre Lots[2]	Lands Zoned In 6-20 Acre Lots[2]	Lands Zoned In 1-5 Acre Lots[2]	Lands Zoned In 6-20 Acre Lots[2]	Lands Zoned In 1-5 Acre Lots[2]	Lands Zoned In 6-20 Acre Lots[2]
County														
Coos	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Curry	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Douglas	1,121	595	449	648	1,536	1,123	1,985	1,771	447	648	1,482	1,069	1,929	1,717
Jackson	15,994	95,346	9,422	80,547	18,107	61,902	27,529	142,449	4,443	37,425	9,204	31,346	13,647	68,771
Josephine	51,671	55,357	22,526	42,288	20,267	32,281	42,793	75,569	15,211	27,597	14,259	22,416	29,470	50,013
Total	68,786	151,298	32,297	123,483	39,910	96,306	72,307	219,789	20,101	65,670	24,945	54,831	45,046	120,501
Resource Area														
Ashland	6,514	43,827	4,925	43,141	9,332	34,942	1,425	78,083	2,732	22,497	5,513	19,452	8,245	41,949
Butte Falls	9,480	51,510	4,493	37,397	8,772	26,956	13,265	64,353	1,708	14,925	3,691	11,893	5,399	26,818
Glendale	2,088	5,581	1,137	5,285	3,329	5,960	4,466	11,245	999	4,684	3,094	5,245	4,093	9,929
Grants Pass	50,704	50,380	21,842	37,660	18,477	28,448	40,319	66,108	14,662	23,564	12,647	18,241	27,309	41,805
Total	68,786	151,298	32,397	123,483	39,910	96,306	72,307	219,789	20,101	65,670	24,945	54,831	45,046	120,501

[1] BLM-administered land inventoried through the TPCC process as suitable commercial forestland and within one-quarter mile of identified county zones (see Appendix 3-RIA-2, Draft RMP).

[2] County zones describing 1-5 acre and 6-20 acre lots is found in Appendix 3-RIA-1, Draft RMP.

Southwestern Oregon has had a substantial growth in population which, in large part, comes mostly from urban areas outside the region. Values and attitudes of immigrating residents may differ from longer-term residents (see Appendix 3-RIA-2, Draft RMP).

A recent study, including questions relating to grazing practices and concerns indicates:

- "The 'interface' has become an important sociological concept for those involved in forestry, indicating not only those geographical locations where we find conflicting uses of adjacent lands, but also the arena in which differing social perceptions of the value of our forest resources clash...." Although some regard timber harvesting and residential development as compatible, many conservationists and timber harvesters share the concern that interface forests are clearly undergoing a transition from remote areas where timber can be extracted relatively easily to places where residents and visitors place a higher value on aesthetics, recreation and wildlife." (Sturtevant 1989a).

BLM Management Concerns

In some cases neighborhood concerns conflict with BLM's present land use goals and objectives (see Timber Resources and Socioeconomic Conditions). Of concern to BLM is how to respond to RIA residents who do not accept intensive land management activities on adjacent public lands. An additional BLM concern is its inability to implement goals and objectives of existing land use management plans while satisfying RIA residents' concerns about intensive forestland management practices.

Communities vary in their sensitivity to BLM management. The following communities, identified by BLM managers, have demonstrated their concerns about BLM land management activities occurring in the RIA. The most sensitive communities are: Applegate Valley, Deer Creek, Evans Creek, Greensprings, Jacksonville, Jumpoff Joe Creek, Lake Creek, Pleasant Creek, Sardine Creek, Sterling Creek, Sunny Valley, Takilma, Upper Cow Creek, Williams, Wolf Creek, and the Wonder areas.

Intense public and professional debate has occurred about the amount of land designated for intensive timber management. This debate intensifies in the RIAs. There have been an increasing number of personal contacts, consultations, meetings, requests, and petitions during the last 10 years. During the past decade, there have been approximately 140 protests, 80 appeals, and 6 civil actions in opposition to intensive land management practices within the planning area (see Table 3-RIA-1). Two of the civil actions were districtwide and concerned the use of herbicides and the cutting of old growth timber. Four civil actions were concerned with a specific timber sale.

Approximately 65 percent of the protests and appeals were on actions in 8 of the planning area's 27 analytical watersheds (see Table 3-RIA-1). The watersheds that have produced the most conflict are Cow Creek-Glendale, Evans Creek, Little Applegate, Middle Applegate, Williams Creek, Grave Creek, Rogue-Wild Section, and Jenny Creek.

Fire Management

Fire and other agents of disturbance, such as wind, insects, and diseases, have greatly influenced the development of the dry site forests of southwestern Oregon (Agee 1990, 1991; USDI 1992; Kauffman 1990). Fine-scale disturbances, generally by insects or diseases, cause deaths of single trees or small groups of trees which result in small patches of early-successional vegetation embedded in a larger portion of older forest. Coarse-scale disturbances, such as fire and wind, result in more extensive areas of early-seral vegetation. Many native forest organisms have adapted to these cycles and scales of disturbance and regrowth.

Fire is the major natural agent of disturbance within the planning area. The distributions, abundance, and dominance of the major plant communities are strongly affected by the frequency, intensity, and extent of wildfire events. Fire has both direct and indirect effects on the forest environment. These effects vary depending on individual forest stand and plant community conditions and composition, as well as fire intensity.

Most of the current late-successional and old growth stands developed from natural regeneration following wildfire events that occurred during the last 100 to 600 years. Some of these fires covered large areas—frequently many thousands of acres. Although these fires were large, they burned in patches of variable intensity and severity, and left many areas of unburned or lightly burned forest.

The natural regime of patchy fires that leave an abundance of large dead trees and lesser amounts of scattered live trees, as individuals and in patches, is the basis for silvicultural methods such as retention of green trees as individuals and in patches. Throughout the planning area, natural disturbances were frequent and of low magnitude, maintaining open forest stands In other areas, less frequent patterns shows an extended period between disturbances which at the time they occurred were often catastrophic.

The long-term frequency, intensity, and extent of fire events (known as the "fire regime") depend largely on climate and weather patterns. Fire characteristics also depend upon the available fuel which is related to past forest management practices, including the use of prescribed fire and the effectiveness of wildfire suppression (i.e., wildfire exclusion). Smoke emissions from wildfires are also dependent upon stand history and weather conditions.

Interruption of natural fire regimes has a direct effect on ecosystem species composition, and sometimes on species persistence. The near exclusion of natural, low-to-moderate intensity wildfires has resulted in a proliferation of fire-intolerant and shade-tolerant species such as white fir species and hardwoods, which are replacing ponderosa pine within the mixed conifer communities. Douglas-fir has also extended its range into drier sites due to fire exclusion. Additional discussions on fire role in the environment maybe found within the Biological Diversity and Vegetation Sections of this chapter.

Changes in long-term soil productivity, stand structure and function, forest health, and biological diversity are also occurring due to the exclusion of fire. The mortality of trees due to insects and disease makes forests more susceptible to high-intensity, stand-replacing fires.

Historically many natural disturbances did not result in complete mortality of stands. Recent fires in the Oregon Cascades killed 25 to 50 percent of trees within the areas burned, leaving 50 to 75 percent of the stands intact (USDA Forest Service 1988, 1989, 1992). The surviving trees are important elements of the new stand. They provide structural diversity and a potential source of additional large snags during the development of new stands. Furthermore, trees injured by disturbance may develop cavities, deformed crowns, and limbs that are habitat components for a variety of wildlife species.

If climatic conditions, fuel accumulation, stand structure, and species composition continue to evolve in the absence of fire, this will result in future fires that will be high intensity catastrophic wildfires that will eliminate critical stand component needed to meet future wildlife habitat requirements.

Within the northern portion of the planning area, large fires and relatively long fire return intervals in moist portions of some river basins resulted in periods during which landscapes contained large areas of relatively unbroken forest cover. In the warmer, drier landscapes of the southern GFMA, fire historically were a more frequent, less intense, and an integral part of the internal dynamics of a typical stand (tens to hundreds of acres).

Also, in these drier landscapes, fire control and timber harvest have decreased the abundance of some types of old growth species, such as ponderosa pine, that are dependent on frequent, low intensity fires. Other types of late-successional forest that are less fire resistant or are less desirable for harvest have become more widely distributed. In these areas, the potential for stand-replacement wildfires has increased, resulting in a higher risk to the stability of current stands reserved for late-successional species and protective buffers along critical streams.

The reintroduction of fire to mimic natural disturbance processes is an important process within late-successional forest ecosystems. This is necessary because natural disturbance regimes have been altered following white settlement. Fire suppression has resulted in significant increases in accumulated fuels, both dead and alive, within most of the forests ecosystems in southwestern Oregon (Agee 1990; Deeming 1990; Kauffman 1990). At the same time, these forests may have become much more vulnerable to insects and diseases (Mitchell 1990; Mutch et al. 1993, Wickman 1992). Due to lack of disturbance, some forests have become quite dense and multi-storied, primarily from the invasion of shade-tolerant species (Tappeiner et al. 1992). Total protection might have been a viable short-term strategy in 1910, but it is not viable today.

Most plant communities in the planning area are adapted to fire, although at the natural recurrence of fire is at widely varying intervals. Some species require periodic fire for their persistence, and many additional species are well adapted to periodic burning. Fire can also be used effectively in the restoration and maintenance of wildlife habitat. Some plant species require canopy gaps that may have been historically maintained by fire. Fire reduces understory competition, increases light, provides nitrogen, and stimulates germination of some fire-adapted species.

The role of fire in the life history of some species warrants further investigation because fire is necessary for the persistence of some species. Underburning may improve habitat for some fire-adapted species. Site-specific treatments are more appropriate than broader scale treatments because some species with limited distributions are fire intolerant. Without resuming underburning, biological diversity would be diminished by the loss of many native plant species and some plant communities.

The combination and interaction of fire frequency, intensity, and extent that occur in an ecosystem are known as a fire regime. Natural fire regimes vary widely across the district. However, some generalizations can be made to characterize the role of fire in natural ecosystem processes. These descriptions are based on knowledge of pre-European settlement fire regimes derived from historical accounts, early forest management inventories, and various imprints of fire on forest stands (e.g., stand ages and other tree ring data). Natural fires regimes are briefly characterized below.

The fire regimes of Pacific Northwest forests span a wide gradient of variation (Agee 1981). Natural fire regimes ranged from infrequent (hundreds of years) stand replacement fires, to very frequent (several years) low-intensity surface fires that had little effect on the canopy trees. Although fire regimes can be described on the basis of characters of the disturbance itself (Heinselman 1981), or character of the vegetation (Davis et al. 1980), another way is by defining the fire regime on the basis of fire effects, or severity (Agee 1990). The system using fire severity is defined in terms of fire effects on dominant tree species, and works well for application to habitat.

A high severity fire is one that top kills most of the vegetation in the stand (70 to 80 percent plus of the basal area); a moderate severity fire top kills 20 to 70 percent; and a low severity fire top kills less than 20 percent of the basal area. Fire, in a silvicultural sense, tends to thin from below, first taking smaller trees and/or those less fire-resistant (thin-barked, for example). It must be recognized that each regime is defined on the basis of the modal severity but that fires of other severity levels are likely to occur as well. The most complex fire regimes are the moderate ones because of the mix of expected fire severities, while the low and high fire severity regimes, normally associated with southwest Oregon, are generally more predictable. Management activities over decades, such as successful fire protection, can change low or moderate severity fire regimes to moderate to high severity fire regimes.

Before the advent of fire suppression in the early 1900s, wildfires played a major role in shaping the Ponderosa Pine and Mixed Conifer Forest found within the Southern Regime of the planning area. Presettlement fire return intervals may be as low as 5 to 10 years (Bork 1985). Intensive fire suppression efforts in the last 60 years have resulted in significant fuel accumulations across broad landscapes, multiple-canopied stands with thick understories, and shifts in tree and understory species composition. These changes may have made forests more susceptible to large, high severity fires and to epidemic attacks of insects and diseases. Such forests, in their present condition, are also more likely to be catastrophically disturbed because of higher physiological stress, caused by increased tree density, higher fire hazard, and higher horizontal and vertical fuel continuity (USDI 1992).

Fire hazard increases, and fires which were once likely to be benign understory fires of low severity become high severity stand-replacement fires. High severity fires did occur in these low severity regimes but not at the scale they now do. Management plans for late-successional and old-growth forests in this province must consider fire management and the stability of forest stands (Agee 1993). A total fire protection strategy has a fairly low probability of protecting late-successional forest habitat during the next century. There is substantial reason to believe the trend toward large fires will continue, and fire severity will become skewed toward higher severity levels.

Much of the remainder of the district is characterized by high fire frequencies, both historically as well as at present. Before the advent of fire suppression in the early 1900s, wildfires played a major role in shaping the forests of this region. Indians may have had significant ignition effects in these drier Douglas-fir forests (Lewis 1973; Boyd 1986). Miners, settlers, and trappers altered the patterns of burning in the 19th Century, and fire suppression has altered burn patterns in the 20th Century (Atzet and Wheeler 1982; Atzet et al. 1988).

From the coastal forests of southwest Oregon to the crest of the Coast Range inland, fire frequency decreases from perhaps 90 to 150 years to about 50 years. Frequencies averaging 20 years have been found in the eastern Siskiyou Mountains (Atzet et al. 1988), and Agee (1991) has documented a similar fire return interval in the eastern Siskiyou between 1740 and 1860 before significant European settlement. In the Salmon River watershed in northern California, Wills (1991) found presettlement mean fire return intervals of 10 to 15 years for Douglas-fir/hardwood forests.

Intensive fire suppression efforts in the last 60-80 years have resulted in significant fuel accumulations across broad landscapes, multiple-canopied stands with thick understories, and shifts in tree and understory species composition. These changes may have made forests more susceptible to large, high severity fires and to epidemic attacks of insects and diseases. Such forests, in their present condition, are also more likely to be catastrophically disturbed because of higher physiological stress, caused by increased tree density, higher fire hazard, and higher horizontal and vertical fuel continuity (USDI 1992; Agee 1993).

Past land use and forestry practices have also altered the condition of stands and landscapes throughout much of the planning area. Typically, plantations are densely stocked with young Douglas-fir trees which often increase the occurrence of human-caused wildfires, as well as increase the rate of spread and extent of fire and other disturbances across landscapes.

The presence of young plantations may increase the risk of loss of intermingled late-successional forests. This is especially true where fire suppression has led to the development of dense understories of shade-tolerant species that increase the potential for severe fire impacts in the reserves. Numerous large and destructive fires have occurred in the past decade. The recent period has been characterized by a trend toward larger fires. A more continuous fuel complex over the landscape is at least partially responsible, fuels have increased within protected stands, and clear-cut stands have exposed slash, not all of which has been fuel treated. In 1987, an extensive lightning storm set off more than 600 fires in southern Oregon, including 19 which reached more than 1,000 acres in size (Helgerson 1988). Fire suppression forces were overwhelmed, and some fires burned for months over rough, semi-accessible terrain. A mosaic of fire severity resulted.

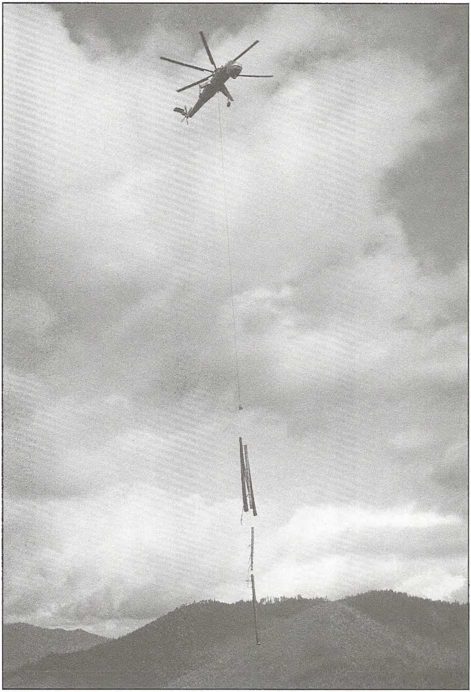
A total fire protection strategy has a fairly low probability of protecting late-successional forest habitat during the next century. There is substantial reason to believe the trend toward large fires will continue, and fire severity will become skewed toward higher severity levels. High severity wildfires have provided conditions that allowed brush and hardwood species to dominate some sites for several decades or longer. Management plans for late-successional and old-growth forests in this province must consider fire management and the stability of forest stands (Agee 1993).

Distribution of Fires by Size Class, 1984 to 1993

Size Class (acres)	Number of Fires	Number of Acres
0.00 to 0.25	486	48
0.26 to 9.99	200	321
10.0 to 99.99	24	760
100.0 to 299.99	8	1,268
300.0 to 999.99	3	757
greater than 1000.0	14	39,727
Total	735	42,881

In a generalized manner, the role of fire management in the maintenance of ecosystems within the planning area is well recognized. Fire management activities consist of wildfire suppression, wildfire hazard reduction, and prescribed fire applications. Fire can be used or suppressed in the context of achieving ecosystem management objectives at the landscape level.

Chapter 4
Environmental Consequences



Summary of Major Changes

This Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS) incorporates by reference the analysis of issues and concerns analyzed in the FSEIS ROD.

Based upon public comment, the watershed condition index (WCI) has been dropped as an analytical tool for evaluating cumulative effects on a watershed basis.

For the PRMP, the display of the PSQ has been moved from Chapter 2 to Chapter 4.

Inclusion of section on impacts associated with SEIS special attention species (from Table C-3, FSEIS ROD) and protection buffer species.

Introduction

Chapter 4, Environmental Consequences, describes potential impacts and changes to the affected environment if any of the alternatives were implemented. At the beginning of Chapter 4 are discussions on how models were used, assumptions made that guided impact analysis, sensitivity analysis conducted, and the use of mitigation in development of alternatives. This is followed by a resource by resource description of impacts or effects which are anticipated if any of the alternatives are implemented. The final section of Chapter 4 addresses consistency with other agency plans and policies.

In this chapter, the environmental consequences (effects) of implementing the alternatives (as described in Chapter 2) are described and compared to the existing conditions (as described in Chapter 3). Effects are described by alternative within each individual resource as appropriate. A tabular comparison of impacts of the alternatives is shown in the Summary of this document (see Table S-2).

Alternatives NA and A through E have been re-analyzed within the context of changed U.S. Forest Service (USFS) management direction specified in the SEIS ROD. To estimate what future actions are likely to occur on USFS lands in order to enhance the discussion of cumulative impacts, the analysis has drawn heavily upon the analyses contained in the Final SEIS and the decisions in the SEIS ROD.

Direct, indirect, and cumulative effects are all considered to the extent identifiable in each analysis (40 CFR 1508.8).

Direct effects are caused by the action and occur at the same time and place.

Indirect effects are caused by the action and are later in time or farther removed in distance but are still reasonably foreseeable. Indirect effects may include growth-inducing effects and other effects related to induced changes in the pattern of land use, population density or growth rate, and related effects on air and water and other natural systems including ecosystems. Cumulative effects are the impacts on the environment that result from the incremental impact of the action when added to other past, present, and reasonable foreseeable future actions, regardless of what agency (federal or nonfederal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time. Effects and impacts as used in this chapter are synonymous. Effects includes ecological (such as the effects on natural resources and on the components, structures, and functioning of affected ecosystems), aesthetic, historic, cultural, economic, social, or health, whether direct, indirect, or cumulative. Effects may also include those resulting from actions that may have both beneficial and detrimental effects, even if the agency believes that the effect will be beneficial.

There are three topics the National Environmental Policy Act (NEPA) requires EISs to address in relationship to the proposed action, which EISs often treat as separate topics.

- Relationship between short term uses and long term productivity.
- Irreversible or irretrievable commitments of resources.
- Adverse environmental effects that cannot be avoided.

These topics are addressed, where relevant, as part of the discussion of environmental consequences for each component of the environment.

The effects of the alternatives are usually compared either to the No Action (NA) Alternative or to the existing condition as appropriate. A baseline period of 1984-1988 was established for air quality and socioeconomic conditions, and that was as a basis of comparison in some circumstances.

Both short and long term time frames were considered. Short term is the period of time during which the plan would be implemented, assumed to be ten years or more. Short term effects include those resulting from harvest of timber sold during the ten-year period, even though such a harvest may occur two or three years after sale. Long term is the period beyond ten years. Long term impacts were not analyzed in detail when meaningful analysis depended on specificity provided by the 10-year timber management scenario, or for some cumulative effects that are primarily dependent on (forecasting) activities on private lands (e.g., effects on elk).

Valid existing rights would continue under all alternatives. Examples of valid existing rights include right-of-way grants issued but not yet constructed, mining claims filed prior to approval of the RMP in an area recommended for mineral withdrawal, reciprocal right-of-way agreements, withdrawal of public lands for use by another government agency, or an existing mineral lease. Valid existing rights may be held by other federal agencies, private individuals, or companies. Those valid existing rights that could have more adverse effects on BLM-administered land and resources include mining claims and reciprocal rights-of-way. The severity of the adverse effects would depend to a large degree on the location of the action in relation to sensitive resources. There is no reasonable way to predict or quantify these potential actions.

Preliminary analysis indicated the alternatives would not significantly effect geology, topography, prime and unique farmlands, wetlands, paleontological values, or renewable energy (i.e., wind, hydro, biomass) use. Therefore, these topics are not discussed in this document. In addition, no analysis of effects on wilderness values is presented since those values have been addressed in the separate Oregon Wilderness EIS completed in 1990.

Analytical models have been used to assess some effects of the alternatives. These models, like all models of complex biological-physical or economic systems necessarily simplify reality. They also are limited by current knowledge, but represent a synthesis of the knowledge of BLM staff and/or outside scientists familiar with the subjects of concern.

Model evaluation involves extensive validation through testing and comparison of predictions with actual outcomes. In that sense, most of the models used are too new to be validated. In fact, such validation of most of these models would take decades. Nonetheless, they provide the most useful available methods, other than professional judgement for comparing probable differences in outcomes from implementation of the various plan alternatives. Confidence in their numbers varies but, in all cases, they are more useful for comparison of the relative consequences of alternatives than for precise predictions.

The application of the models to Alternative C and the PRMP are attended by lower levels of confidence than the analyses of other alternatives. This is partly due to the untested nature of many of the prescriptions of these alternatives. The confidence level in all analyses of the effects of the PRMP is also lower because the results of watershed analyses and Adaptive Management Area planning may modify both the rate and location of timber harvests, as well as management prescriptions. However, adaptive management will assure that objectives are met.

In addition to the detailed analyses of the effects of the seven alternatives, BLM has conducted sensitivity analyses of the effects of selected management approaches. Sensitivity analysis is a process that identifies opportunity costs associated with differing approaches to sensitive land-use allocations and other decisions. It can assist selection of an RMP by examining specific trade-offs that could result from making changes in single sensitive elements of an alternative.

Sensitivity analyses of some consequences of several alternatives were conducted during preparation of the Draft RMP/EIS and summarized in Appendix 4-I-1, Draft RMP. Additional sensitivity analysis of the following, as potential changes in the PRMP, have been made and are summarized in the Timber Resources section of this chapter.

> First, excluding all critical northern spotted owl habitat from planned timber harvest.
> Second, foregoing some or all proposed intensive timber management practices (genetic tree selection, fertilization, and precommercial thinning/release).

The following assumptions were used as a basis for analysis of impacts:

- Sufficient funding and personnel would be available for implementation of the final decision. (If sufficient funding and personnel are not available, most environmental consequences would be less than predicted, but most effects on socioeconomic conditions would be greater.)

- The probable sale quantity and annual average silvicultural practices for the alternatives as shown in Table 4-I-1.
- For long term analysis, the allocations in the alternatives would be continued for many decades.
- Standard design features described in Chapter 2 would be applied as described. They contain many of the mitigating measures that avoid, minimize, reduce, or eliminate potential environmental effects.
- Local climate patterns of historic record and related conditions for plant growth would continue.
- During the expected ten or more years life of the plan, approximately one to two miles of new roads per year would be constructed across BLM-administered land by private parties under the terms of existing reciprocal right-of-way agreements.
- For analysis of cumulative effects, most private forestlands would be intensively managed with final harvest on commercial economic rotations averaging 60 years.

The probable sale quantity (PSQ) for the PRMP is an estimate of annual average timber sale volume likely to be offered from lands allocated to planned, sustainable harvest. It is an approximation because of the difficulty associated with predicting actual timber sale levels over the next decade, given the complex nature of many of the standards and guidelines, and overlapping land use allocations. It represents BLM's best assessment of the average annual amount of timber likely to be offered over the life of the plan, following a start-up period. The use of PSQ, rather than "allowable sale quantity" (ASQ), recognizes the estimate may change due to uncertainties in the assumptions. Harvest of this approximate volume of timber is considered sustainable over the long term based on the assumptions that the available land base remains fixed and that funding is sufficient to make planned investments in timely reforestation, plantation maintenance, thinning, genetic selection, forest fertilization, timber sale planning, related forest resource protection, and monitoring.

The actual sustainable timber sale level attributable to the land-use allocations and management direction of the PRMP may deviate by as much as 20 percent from the identified PSQ. The potential variables are discussed in the Timber Resources section of this chapter. The separable component of the PSQ attributable to lands in key watersheds also carries a higher level of uncertainty, due to the greater constraints of Aquatic Conservation Strategy objectives and the requirement to do watershed analysis before activities can take place.

Not included in the PSQ estimates is "other wood" or "nonchargeable volume." This is timber harvest conducted to meet other resource objectives or which occurs on lands where there are no scheduled timber harvest. An estimate of 10 percent is assumed for all alternatives (see Table 4-I-1).

During the first several years, it is unlikely that the annual PSQ or the nonchargeable volume will be offered for sale. The PRMP presents a new forest management strategy. It will take time to develop new timber sales that conform to the PRMP.

A 10-year representative timber management scenario was developed based on the land use allocations for each alternative, except the No Action Alternative (NA). Its primary use is to assess potential short term, site-specific effects associated with timber harvesting. The scenarios were developed for analytical purposes only and do not reflect what would actually occur on the ground. The scenarios represent the resource area staffs' assumptions as to one possible location of timber harvest units and road locations. A total harvest scenario (harvest units and roads) was built for the land that would be available for timber harvest in Alternative A. This scenario was then adjusted to reflect the changes in land available for timber harvest in the each alternative, except the PRMP.

For alternatives A through E, random spatial selection of timber harvest units was linked to the TRIM-PLUS probable sale quantity calculation to determine the 10-year scenario that meets management selection criteria to provide the calculated probable sale quantity identified for the alternative. The selected scenarios were evaluated for practicality by resource area timber sale planners. Estimates of logging practices and average annual levels of associated activities and intensive management practices for the decade of the plan are displayed in Table 4-I-1.

For the PRMP, the tie to a set of representative harvest units was not performed. One reason is that the representative timber harvest units and roads assumed for alternative A would not be applicable to the PRMP because of its enlarged riparian reserve systems and other changes in the plan. A set of new 10-year representative harvest units could be developed to fit the PRMP, except that many of the intermittent streams are not currently mapped in the GIS. Without the full spatial representation of the riparian reserves, the resource area planners would not be able to evaluate the scenario for practicality.

Accordingly, for the PRMP, the acreage by age class and timber type scheduled for harvest in the first decade was randomly depleted in average harvest unit quantities from across the available land-use allocations and inventory to estimate the effects of harvest.

While the target volume over the life of the plan would not change, actual timber sale and management plans would differ from the ten-year scenarios. The scenarios provide an analytical tool, however, to help provide more specificity to analysis of effects of the alternatives. Actions (such as timber sales) implementing the planning decisions will be analyzed before implementation to determine if impacts addressed in the EIS might differ significantly from those predicted based on the 10-year scenarios.

Expected mineral exploration and development activity ten-year scenarios have also been developed and are set forth in Appendix X.

Analysis of the alternatives is also based on their different levels of planned activities as shown in Table S-1.

This EIS incorporates by reference the conclusions of the Final SEIS. Specifically incorporated are conclusions about Alternative 9 of the FSEIS, which is embedded in the PRMP.

Incomplete or Unavailable Information

There is less than complete knowledge about many of the relationships and conditions of wildlife species, forests, the economy, and communities. The ecology, inventory and management of large forests are a complex and evolving discipline. The biology of the specific species prompts questions about population dynamics and habitat relationships. The interaction among resource supply, the economy, and rural communities is also the subject of an inexact science.

There is a substantial amount of credible information about the topics of this environmental impact statement; the central relationships and basic data are well established. The best available information was used to evaluate the alternatives. When encountering a gap in information, the question implicit in the Council on Environmental Quality regulations on incomplete or unavailable information was posed: Is this information "essential to a reasoned choice among alternatives"? (40 CFR 1502.22(a)). While additional information would often add precision to estimates or better specify a relationship, the basic data and central relationships are sufficiently well established that any new information would be unlikely to reverse or nullify understood relationships. Though new information would be welcome, no missing information was considered to be essential to a reasoned choice among the alternatives as they are constituted. For issues or concerns analyzed in the FSEIS, to which this document is tiered, the most complete and up-to-date information was used.

Nonetheless, the precise relationships among the amount and quality of habitat and the future populations of species are far from certain; there is a certain level or risk inherent in the management of forestlands even to standards based on conservative application of those relationships. For example, if the relationship between habitat and population were significantly different from how it now seems, or if management standards were to be broadly misapplied, the population and long term viability of affected species would be at greater risk than that generally estimated in this document.

All other things being equal, the lesser the information, the greater the risk attributable to incomplete knowledge. That relationship is an impetus for the monitoring and adaptive management that is part of the PRMP, in particular. Should there be new scientific information on change in habitat conditions not projected, there are provisions for changing management of the forest to reflect the new information and the management practices for which it calls. This adaptive management process, which is guided by monitoring, research, and interagency coordination, provides additional assurance of compensating for possible catastrophic changes.

Mitigation

Mitigation is important in the design and implementation of any alternative. In general, "mitigation" is a measure taken to cause an action to become less harsh or less severe. From the Council on Environmental Quality (CEQ) Regulations (40 CFR 1508.20), mitigation includes:

- Avoiding the impact altogether by not taking a certain action or parts of an action;

- Minimizing impacts by limiting the degree or magnitude of the action and its implementation;
- Rectifying the impact by repairing, rehabilitating, or restoring the affected environment;
- Reducing or eliminating the impact over time by preserving and maintaining operations during the life of the action; and
- Compensating for the impact by replacing or providing substitute resources or environments.

In the design of alternatives and throughout the discussion of environmental consequences in this chapter, mitigating measures and Best Management Practices have been incorporated and evaluated. For the actions analyzed in this PRMP/FEIS, mitigating measures are addressed primarily through land allocations and management practices and standards as described in Chapter 2.

Some examples of such mitigating measures built into the design of alternatives and identified in Chapter 2 are as follows:

- Selection of timber harvesting techniques and timing to minimize soil damage;
- Design and timing of prescribed burns to minimize effects on soils, wildlife habitat, and air quality;
- Wildlife tree retention; and
- Allocation of lands to riparian management areas/ riparian reserves.

Effects of the Alternatives

Analysis of the alternatives are based on their different levels of land use allocations and management actions as described in Chapter 2, including Management Direction Common to Alternatives NA-E, along with the 10-year scenarios.

Effects on Global Climate

Scientific opinion anticipates noticeable global warming during the 21st century, however, there is a substantial scientific uncertainty about the rate of such warming. A report of the Intergovernmental Panel on Climate Change said temperature increases could range from 1°C to 5°C by the year 2100 (Schneider 1991).

The primary factors leading to the expectation of warming are substantial increases in atmospheric carbon dioxide, nitrous oxide, methane, chlorofluorocarbons, and other trace gases attributed to human activity. BLM's land management activities in the planning area would effect primarily the amount of carbon dioxide released into the atmosphere. Forecasts suggest that global carbon dioxide increases from the level existing in 1900 may double some time between the years 2030 and 2080 (Schneider 1989). However, effects under all alternatives would result in only a slight increase in atmospheric carbon dioxide levels.

A key factor in assessing the effect of timber harvest and forest regrowth on the amount of carbon in the atmosphere is the amount of carbon stored within the trees of the forest (see Appendix 4-GC-1, Draft RMP). One analysis shows forests managed on rotations of less than 100 years would store less than half the amount of carbon stored in old growth stands (Harmon, Ferrell and Franklin 1990) thereby leaving more carbon in the atmosphere. Analysis indicated that about 42 percent of timber harvested in the northwestern U.S. enters long term storage in products, while paper production largely results in the loss of carbon dioxide to the atmosphere (Harmon et al. 1990). Commentors on the analysis have suggested some factors relevant to assessing the impact of timber harvest levels on global climate were apparently not considered in this analysis, which overstates the effect of timber harvest. These factors include the slow decomposition of products entering landfills, possible emissions increases if fossil fuels are burned in lieu of wood or wood products, and emissions associated with substitution of alternative construction materials for wood or substitution of wood from virgin forests outside the northwestern U.S.

Calculations indicate each million acres of old growth forest harvested in the northwestern U.S. would add less than one-tenth of one percent to the total carbon currently in the atmosphere (Harmon et al. 1990). The largest acreage of old growth (age class 200+) proposed for harvest in any plan alternative is about 43,100 acres in Alternative A, while the PRMP would harvest about 17,000 acres of old growth. Although young, fast growing trees store less carbon in total, they absorb more carbon from the atmosphere than older trees. Fertilization, vegetation management, and planting genetically-selected stock all enhance this effect due to increased growth rate.

In mature and old growth stands, release and absorption of carbon dioxide tend to be in balance. However, logging, especially clearcutting, increases the rate of decomposition of debris on the forest floor thereby releasing more carbon dioxide. In the absence of timber harvest, wildfires with less magnitude due to wildfire suppression in the short term would have similar effects but over a shorter period of time. Not until a young stand reaches the stage of canopy closure does its carbon uptake offset the release from decomposition (Alaback 1989).

One forest practice that directly contributes carbon dioxide to the atmosphere is prescribed burning after timber harvest. However, in the absence of prescribed fire, the decay of the same wood over many years would contribute a similar amount of carbon dioxide. The largest amount of slash burning anticipated over 10 years is 830,000 tons of fuel (see Effects on Air Quality). This is the projected level under the NA Alternative, which is the maximum anticipated under any alternative. Under the PRMP, approximately 640,000 tons of fuel would be burned. The theoretical maximum amount of carbon dioxide released into the atmosphere would occur under Alternative A, with a release of 1,245,000 tons of carbon dioxide during the life of the plan. Burning a ton of slash can create up to one and one-half tons of carbon dioxide as the released carbon combines with oxygen. In the long term, a managed forest would be in balance with its release and absorption of carbon dioxide just as an unmanaged forest. Given that half of newly injected carbon dioxide would remain in the atmosphere (Schneider 1989), a decade of harvest of some older forest and prescribed burning under the PRMP could add approximately .00048 percent to the carbon in the world's atmosphere, an unavoidable adverse effect.

The cumulative effects of BLM activities under the PRMP and similar activities proposed or anticipated on other forestlands in western Oregon for the expected 10-year life of the RMP would add an estimated 180 tons of carbon dioxide to the world's atmosphere, increasing carbon by 0.02 percent. This includes old growth timber harvest indicated by the PRMP in other BLM Draft RMPs for western Oregon, the U.S. Forest Service Preferred Alternative in their Final EIS, Management Direction on Northern Spotted Owls (1992), as well as prescribed forest management burning by all landowners as controlled by the ceilings established in the Oregon Smoke Management Plan and the Washington State Smoke Management Plan. The effect on global climate would be slight. Total increases in atmospheric carbon dioxide from all worldwide sources by comparison are occurring at a rate of almost one-half percent annually (Trexler 1991).

Effects on Air Quality

Major sources of air pollutants associated with BLM resource management activities are smoke from prescribed burning; application of herbicides used to control unwanted vegetation; and dust from use of unsurfaced roads, road construction, and maintenance. The effects associated with herbicide use can be found in the Final EIS for Western Oregon-Management of Competing Vegetation to which this RMP/EIS is tiered (see Appendix 1-D, Draft RMP).

Dust from new road construction and maintenance of older unpaved roads normally settles within a short distance from the point of origin. It has a negligible effect away from the construction and maintenance sites. Dust associated with road use also has negligible effect away from unpaved roads. Localized effects from road dust would be felt by residents within the rural interface area (RIA) for all alternatives. The major adverse effect would be local and during the summer months when dust is produced from both public and administrative use of unpaved roads.

Prescribed burning is the only resource management activity proposed under any alternative that could have a notable adverse effect on local and down wind air quality. The effect of smoke from prescribed burning would either reduce visibility within a project area, or under adverse meteorological conditions, could concentrate the smoke around the project site and within the connecting drainage with a subwatershed around the project area.

Under all alternatives, prescribed burning would comply with the guidelines established by the Oregon Smoke Management Plan (OSMP) and the Visibility Protection Plan. The focus of the analysis of the effects by alternatives is on the production of PM10 (Particulate Matter smaller than 10 microns), which is a portion of the total particulate matter (Smoke) produced as a result of the Medford District's resource management activities. PM10 is identified by the State Implementation Plan (SIP) as the basis for nonattainment within the Grants Pass and Ashland/Medford nonattainment area. Prescribed burning is the major source of PM10 as a result of BLM's resource management activities. In addition to prescribed fire, typical sources of PM10 include industrial processes, woodstoves, roads, agricultural practices, and wildfires.

Projected Emissions

Historically, annual slash treatment levels have varied between 30 and 70 percent of the total harvested acres available for fuels treatment. Major limitations have been air quality restrictions and prescribed fire prescription parameters. Estimates of the expected annual acreage of prescribed fire use were calculated for each of the alternatives.

Broad assumptions regarding the ecological need for prescribed burning, the hazard reduction that might be necessary for risk management, and the amount of prescribed burning necessary for site preparation and other silvicultural treatments were made at this planning level. These estimates are very generalized because many assumptions about the level of prescribed fire use for each land allocation within the planning area cannot be validated until watershed analysis, Late-Successional Reserve assessments, Adaptive Management Area plans, or project level plans are completed.

The amount and type of prescribed burning projected under Alternatives C, D, E, and the PRMP represents a shift in emphasis compared to historical uses of prescribed fire. In the past decade, the majority of prescribed burning has consisted of broadcast burning of logging slash for site preparation and management of competing vegetation. In addition to preparing the site of tree planting, some of this burning simultaneously contributed to fuels hazard reduction. These historical uses of prescribed fire are maintained and emphasized in Alternatives NA, A, and B. Use of broadcast burning to meet silvicultural objectives would be a part of all alternatives; while Alternatives C, D, and E use a combination of under-canopy and broadcast burning to meet the site preparation and fuel treatment objectives.

In the PRMP, prescribed burning emphasizes ecosystem restoration, habitat restoration and maintenance, and hazard reduction. In this alternative, much of the proposed burning would be underburning, in both natural and managed stands. Burning for hazard reduction and site preparation may frequently take place in stands with many more trees retained after harvest than in the recent past, necessitating changes in prescribed fire techniques. Burning piles of slash after harvest or for hazard reduction, would be done during the most favorable emission dispersion conditions. This continues a recent trend in fuels management leading to further emission reductions as well as reduced impacts.

The shift in emphasis in the Medford District from broadcast burning to underburning has some inherent smoke and resource management risks. The objective of burning large areas in order to develop mosaics of vegetative conditions and seral stages is accomplished by varying fire intensity and timing of each burn. While this approach mimics natural underburning conditions, there are risks associated with retaining coarse woody debris; the likelihood for re-ignition is increased, as is the possibility for a prescribed burn to escape the planned burn area. Consequently, the potential for additional, unanticipated emissions are also increased. Furthermore, costs associated with the need for rapid extinguishment of smoldering fuels will be high compared to current methods that wait for spring and fall/winter rain to extinguish the prescribed burn.

The majority of the prescribed fire use in the planning area would be scheduled primarily during the period starting in March and ending in June. This treatment period minimizes the amount of smoke emissions by burning when duff and dead woody fuel have the highest moisture content, which reduces the amount of material actually burned. Broadcast burning, concentration burning, and underburning would also be planned during the winter and spring months to reduce damage to the site from high intensity burning and to facilitate control of the units being burned. Control of broadcast type prescribed burning, as oppose to pile burning, becomes increasingly more difficult during the month of June (see Chapter 4, Effects on Wildfire).

It is anticipated that by prescribed burning under advantageous weather conditions, subsequent wildfire emissions would be reduced due to a decreased amount of available fuel and a lowered risk of large-scale wildfire. The local impacts to residents in rural communities and nonattainment areas may be reduced through the use of an active fuels management program that may include prescribed fire.

Most wildfires on the Medford District occur during the period of June 15 to October 15 while the majority of prescribed burning is conducted from March 15 through June 1 and during the winter months. Wildfire smoke will impact the designated nonattainment areas during the course of a typical fire season, while prescribed fire plans are specifically designed and conducted to minimize both their emissions and impacts to the designated nonattainment areas. The number and intensity of intrusion into these areas from Medford District activities have steadily declined.

As stated previously, this air quality analysis focuses primarily on the production of PM10 from prescribed burning by alternative. Another source of PM10 emissions is from wildfires. Adverse impacts from wildfires can be far more impacting because of the large quantities of total suspended particulate emitted by these high intensity fires when conditions are driest and consumption is the greatest during the summer months. The actual level of emissions is unknown due to lack of comprehensive monitoring data; however, it is known that potential health risk, due to increased PM10 levels above what would be produced from prescribed burning, is greater for wildfires during air stagnation periods. A single wildfire can produce more smoke than all of the planned prescribed burning by all federal and state sources in the planning area during any one season.

The monitoring and inclusion of wildfire PM and PM10 levels are a major unknown factor on the actual health impacts from PM10 on the populace within southern Oregon and northern California. Any baseline established for future planning should include the contribution of wildfire smoke when developing control strategies where fire plays a major ecological role in shaping the vegetative communities, such as in southern Oregon and northern California.

The reduction of visibility caused by PM10 and the role PM10 plays as a carrier of other toxic pollutants. In addition, the long term health impacts from wildfire emissions needs to be determined.

Emissions by Alternatives

Under all alternatives, smoke emissions from BLM burning would be less than the 1984-1989 average historic emission level. The 1984-1988 baseline was used to measure district progress towards the 50 percent reduction goal for total suspended solids (TSP) emissions from forestry burning for all of western Oregon by the year 2000 (see Chapter 3, Air Quality for further discussion).

Alternatives NA, A, and B would have the greatest potential impact on air quality, with each proposing to emit roughly 45 to 53 percent of the baseline PM10 levels for all prescribed burning (1984-1988). Alternatives E and the PRMP have the least potential impact on air quality, with projected PM10 emissions from prescribed burning of approximately 17 to 25 percent of baseline levels. Alternatives C and D are projected to emit at a moderate level, with roughly 32 to 34 percent of baseline PM10 levels from prescribed fire use (see Figure 4-A-1). For a description of the techniques used to estimate emissions for the PRMP, see the Air Quality Analysis Sections, Chapters 3 and 4, FSEIS.

As state above, Oregon has an established emission reduction goals for total suspended particulate (TSP) emissions, which includes PM10, from prescribed burning. The goal calls for a 50 percent reduction in these emissions by the year 2000. To obtain some indication of how future burning may impact emission reduction goals, the emissions estimates for alternatives were compared to the Oregon TSP baseline. For each alternative, projected emissions for the entire planning area are well below the baseline value for historic burning. Therefore, it appears that fire use in the future will not compromise the ability of the State to reach prescribed burning emission reduction goals under all alternatives.

Prescribed burning under all alternatives is not expected to effect visibility within the Crater Lake National and neighboring wilderness smoke sensitive Class I areas (Kalmiopsis and Mountain Lakes) during the visibility protection period (July 1 to September 15). Prescribed burning is not routinely conducted on the Medford District during this period primarily due to the risk of an escape wildfire.

Prescribed burning emissions, under all alternatives, is not expected to adversely effect annual PM10 attainment within the Grants Pass, Klamath Falls, and Medford/Ashland nonattainment areas. Any smoke intrusions into these areas from prescribed burning are anticipated to be light and of short duration.

The greatest potential for smoke intrusions into the nonattainment areas would come from underburning activities proposed under Alternatives B, C, D, E, and the PRMP. Alternatives A and the NA would have less potential because most of the burning would be accomplished through broadcast burning and alternative treatments (hand pile and manual treatment).

Even though the risk of an intrusion is greater from underburning, the severity and extent to which the intrusion would spread is far less because the level of emissions and the amount of fuel burned (energy released) are far less compared with broadcast and pile burning (see Chapter 3, Air Quality).

Total suspended particulate emissions from underburning would average between 5-10 tons for

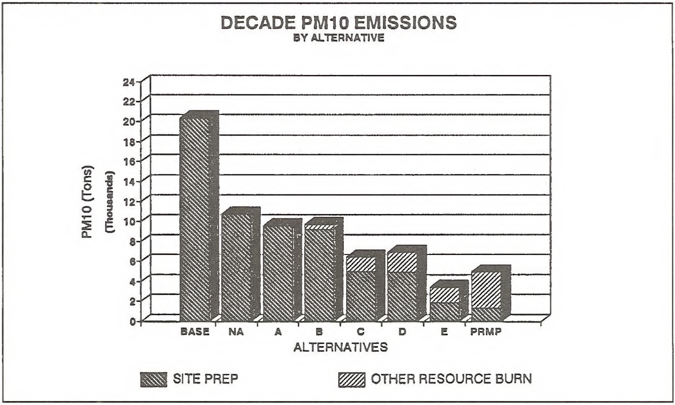


Figure 4-A-1: *Decade PM10 Emissions*

each acre burned while emissions from broadcast and pile burning (both hand and tractor) would average between 16-27 tons. PM10 is emitted at a rate of 26 pounds per ton of fuel consumed. The difference in total emissions is due to the higher burning intensities needed for broadcast burning and the increase in burning efficiency when material is piled and burned. In addition, further reductions in level of emissions from underburning could be accomplished by rapid mop-up of the burned area immediately after ignition. Smoldering can be responsible for up to 80 percent of the total PM10 emissions produced.

Total PM10 emissions and a greater chance for a serious intrusions from prescribed burning would be the highest under Alternatives A, B, and the NA; and lowest under Alternative E compared with the base period. The amount of underburning would increase for Alternatives B, C, D, E, and the PRMP compared to the base period; while total emissions would be less, the potential risk of a low to moderate smoke intrusions may increase on private land in close proximity to the project area.

Prohibition of prescribed burning in the RIAs under Alternatives D and E would reduce short term adverse nuisance visibility effects and the risk of smoke intrusions into adjacent rural areas. However, there would be an accumulation of fuel and resultant increased risk of stand replacement wildfire, which would have the potential to effect both wildfire emissions as well as to inflict property and resource damage.

Conclusions

Current avoidance strategies for prescribed fire assumes that smoke can be lifted from the project site and dispersed and diluted by transport winds. However, underburning (as proposed under Alternatives B, C, D, E, and the PRMP) requires a low intensity burn that would not have the energy to lift the smoke away from the project site. Smoke retained on site could be transported into portions of nonattainment areas if it is not dispersed and diluted by anticipated weather conditions. Localized concentration of smoke in rural areas away from nonattainment areas may continue to occur during prescribed burning operations.

Alternatives A, B, and the NA are projected to result in the highest total PM10 smoke emissions as well as greater chance for major intrusions from prescribed burning. Alternative E and the PRMP would produce the lowest level of emissions and the least risk of smoke intrusions. Alternatives C and D would increase the amount of underburning compared to the base period. While emissions would be less, the risk of these lighter intrusion would increase under these alternatives.

Under all alternatives, the use of prescribed fire, including underburning, would not compromise the ability of the State to reach prescribed burning emission goals by the year 2000.

Adverse impacts from wildfires can be far more impacting because of the large quantities of total suspended particulate emitted by these high intensity fires when conditions are driest and fuel consumption is greatest during the summer months. A single wildfire can produce more smoke than all of the planned prescribed burning by all federal and state sources during any one season.

Determination of the cumulative smoke impacts of all federal burning and whether this burning conforms with the Clean Air Act will be evaluated through watershed analysis, province planning, or project planning, as appropriate. This level of planning will be coordinated among all neighboring federal agencies to assure that the proposed use of prescribed fire needed to meet ecosystem management as directed by the FSEIS/ROD does not violate the State Implementation Plan and the Clean Air Act.

Effects on Soils

Soil Productivity

Long term soil productivity is the capability of soil to sustain inherent, natural growth potential of plants and plant communities over time. Both soil and nonsoil factors influence productivity. Nonsoil factors such as climate and geology are not influenced by forest management activities. Soil factors, which can be modified by management activities, are soil moisture, soil aeration, organic matter content, nutrient availability, and soil biology. Most forest uses ultimately depend on a productive soil resource, and maintenance of long term soil productivity is widely recognized as a basic requirement of forest management. The extent to which long term soil productivity is affected by management activities is not precisely known because of the site variables involved and the limited investigations that have taken place. Some researchers suggest productivity may not be sustainable over the long term under an intensive management regime such as that proposed for the No Action Alternative, Alternatives A and B and the intensively managed sites under the other alternatives.

Soil fertility may be diminished over time by repeated cycles of harvest, site preparation, and control of competing vegetation (Perry and Maghembe 1989). Although management prescriptions, mitigation, and amelioration measures have been designed to keep the extent and duration of adverse effects on soils within acceptable levels, adverse effects cannot be completely eliminated. The extent of those effects depends on numerous factors. Soil type and condition, topography, success of planned practices and mitigation measures, equipment used, and the skill of individual equipment operators contribute to the degree of disturbance and resultant effects. However, implementation of the management prescriptions (Chapter 2) and best management practices (BMPs) in Appendix F that address forest management activities such as timber harvest, site preparation, road construction, mining, recreation, and off-highway vehicle use should prevent unacceptable degradation of the soil resource.

The most common types of disturbances effecting soils and associated long term productivity are displacement and compaction, surface erosion and landsliding, alteration of nutrient status, and changes in soil biology (see Appendix 4-S-1, Draft RMP). The timber productivity capability classification (TPCC) identified fragile soils and landscapes that are considered particularly sensitive to management activities. All soils, however, are considered to be susceptible to long term soil productivity losses. The following sections compare the alternatives based on the potential for reducing soil productivity on lands classified as fragile, and the types of disturbances that could cause reductions in soil productivity.

The analysis of impacts of the Proposed Resource Management Plan (PRMP) incorporates by reference the analysis and conclusions in the Final SEIS regarding soil productivity.

Fragile Sites

The TPCC identifies fragile sites that are judged to be incapable of supporting a sustained yield of forest products (fragile nonsuitable woodland classification). Under Alternative A, planned timber harvest would take place only on the fragile slope gradient nonsuitable woodlands of this category. The fragile slope gradient lands are considered to be more of a reforestation problem than a fragile problem because the surface of the soil is covered with gravel and cobbles, which would make planting of seedlings difficult if not impossible. However, there is a concern that surface disturbance associated with timber harvest could cause unacceptable soil productivity loss unless appropriate practices are employed.

Also identified in this category are sites classified as fragile suitable commercial forestland that are subject to unacceptable soil productivity loss as a result of management activities unless specific restrictive or mitigation measures are used to protect them. These lands are considered fragile because of the potential for surface erosion, landslides, nutrient losses, or because of the presence of a high water table or excessively steep slope gradients. The acreage of fragile lands to be harvested annually by alternative are shown in Table S-1.

Alternatives A, B, and the NA harvest the most acres of fragile suitable, restricted lands. The potential for soil productivity loss would be greatest if one of these alternatives was selected because of the sensitivity of the lands to management activities and the amount of acres effected. In addition, even-aged silvicultural systems would be utilized, except in frost hazard areas, which characteristically disturb more surface area and remove more organic matter (coarse woody debris and duff) from harvested sites than do shelterwood retention systems.

Under Alternative C, approximately one-half as much land would be entered and, therefore, subject to disturbance as proposed in the aforementioned alternatives. All lands would be managed under structural retention silvicultural systems that prescribe a “lighter touch” than do even-aged silvicultural systems. A 150-year rotation length, retention of dead nonmerchantable material and live green culls, and maintenance of biological diversity would be beneficial for preserving nutrients and maintaining soil productivity. Approximately the same amount of acreage would be disturbed by implementing Alternative D as in Alternative C.

Under Alternative D, shelterwood retention or structural retention systems would be used on all lands classified as fragile because of surface erosion or landslide potential. These categories of fragile lands comprise less than 50 percent of the fragile lands identified. Because the amount of soil disturbance from timber harvest and site preparation is more extensive when employing even-aged silvicultural systems versus retention systems, it is anticipated that potential productivity losses would be greater for Alternative D than Alternative C.

Alternative E harvests approximately one tenth of the acreage in Alternatives C and D and therefore, would have the least adverse effect on soil productivity.

The PRMP has the potential to reduce long term soil productivity on approximately 300 acres annually of the fragile suitable commercial forestland. To reduce adverse effects, the management scenario for the southern GFMA would be applied to lands classified as fragile because of surface erosion potential in the northern GFMA. Road construction would also be restricted and broadcast burning would not occur. In summary, the amount and types of soil-disturbing activities on fragile lands associated with timber harvest in the PRMP would be less than the NA Alternative and Alternatives A, B, C, and D, but more than Alternative E.

Mining activity is anticipated to be very limited under all alternatives. However, Alternatives D, E, and the PRMP require special management to reduce adverse soil effects caused by the extraction of locatable minerals on lands classified as fragile based on surface erosion and landslide potential.

Compaction and Displacement

Soil compaction and displacement, which effects growth, is a combined effect which cannot be separated. Detrimental soil compaction is assumed to occur at depths greater than two inches and is evidenced by an increase in soil density of 15 percent or more over the undisturbed level (USFS standard in Forest Service Manual Supplement 45, Section 2520.4). Soil compaction effects are long term and can occur on all soils within the planning area.

Acres of timber harvest with tractor and machine piling for site preparation and other management activities that cause soil compaction and displacement vary by alternative. Based on research and past monitoring of operational activities, it is assumed there would be a 5 percent loss of productivity on all lands that would be machine piled and/or tractor harvested under all alternatives; the loss is accounted for in the nondeclining timber harvest calculations. The effects of soil compaction from cable yarding, although recognized, have not been well documented in the literature. However, it is anticipated that alternatives with the largest acreage of cable yarding with partial or no suspension would have the greatest potential of causing compaction that would reduce soil productivity.

Alternative A would have the greatest potential for soil compaction and subsequent productivity loss;

2,200 acres would be harvested with a tractor (largest amount of acres), 140 acres would be machine piled, and approximately 6,700 acres would be cable yarded. Soil compaction would be least under Alternative E but similar to the PRMP; less than 400 acres would be harvested with a tractor, less than 20 acres would be machine piled, and approximately 1,100 acres would be cable yarded. Under the PRMP, approximately 300 acres would be tractor yarded, approximately 50 acres would be machine piled, and approximately 2,000 acres would be cable yarded using partial suspension. The amount of compaction and displacement anticipated under the other alternatives would decrease in the following order: B, NA, C, and D. For acreage effected under the alternatives, see Table I-1.

Road construction, which is an irretrievable/ irreversible commitment of the soil resource, causes compaction/displacement as well as erosion and would occupy between 300 and 400 acres in the NA Alternative and Alternatives A, B, C, and D. Under Alternative E and the PRMP, approximately 120 acres, or one-third of the acreage of the other alternatives would be committed to roads. Other activities such as mineral exploration and development and recreational development are anticipated to effect very few acres under any of the alternatives.

Soil Surface Erosion and Landsliding

The soils in the planning area are subject to two types of erosion that can remove or relocate soil: surface erosion and landsliding. Natural surface erosion rates are very low in undisturbed forested areas of southwestern Oregon. Overland flow of water and associated erosion are rare, except on roads and other compacted surfaces. Undisturbed soils have a protective cover of vegetation, duff and litter, and a high infiltration rate that allows rapid water intake. In general, any soil loss due to erosion is considered to have a negative effect on long term soil productivity as soil nutrients, water supplying capacity, and rooting depth are reduced. However, no conclusive productivity analysis is possible due to lack of data relating surface erosion to forest soil productivity. Indications are that topsoil removal will negatively effect productivity.

Forest management activities can accelerate surface erosion processes by creating more exposed and/or compacted soil. Compacted soils cannot absorb water fast enough during heavy rains to prevent runoff. Overland flow of water can cause rills and gullies. Eroded soil may move only a short distance and be redeposited on-site, with minimal effect on long term soil productivity. If the erosive force is great enough, it may be carried off-site and into streams as sediment.

Landslides effect less than one percent of the district's land base but may cause off-site effects. They can have major effects on water quality and fish habitat and can greatly effect long term productivity of the site where the landsliding occurs. Alternatives that prescribe more surface-disturbing activities on areas that are subject to surface erosion and landsliding have the greatest potential for decreasing soil productivity (see Fragile Sites). Those activities that are more likely to cause the greatest potential for increased surface erosion and landsliding are road and landing construction, timber harvest, machine piling and scarification, and broadcast burning. Research has shown that roads can contribute more than half of the erosion that occurs from forest management activities. Other activities such as mining, recreation, and off-highway vehicle (OHV) use can also cause erosion. However, Management Direction Common To All Alternatives and BMPs provide practices that would reduce compaction, bare soil exposure, and related erosion.

As previously stated, the NA Alternative and Alternatives A through D would require the most road construction (300 to 400 miles). Alternative E and the PRMP would require approximately one third the road construction as the other alternatives.

The other management activities that have the potential to cause surface erosion or landslides vary by alternative with the most disturbance projected under the NA and Alternative A. It is anticipated that under Alternative C there would be less erosion than Alternative D because of a "lighter touch" with more acres being partial cut versus clearcut, and no proposed machine piling for site preparation. Implementation of Alternative E would result in the least number of acres being disturbed through management activities. Under the PRMP, the anticipated erosion would be considerably less than the NA Alternative and Alternatives A and B; slightly less than Alternatives C and D, and slightly more than Alternative E.

Nutrient Status and Soil Biology

Because of the interdependence between above-ground organic matter supplies and soil nutrient cycling and availability, management of the surface organic material can strongly influence soil productivity. Decaying plant components, including coarse woody debris, produce an organic layer on the soil surface that decomposes into soil organic matter. This provides plant nutrients, a supply of energy for soil micro-organisms, and a medium for water storage. Soil microorganism activity has been directly linked to soil productivity (Harvey et al. 1979). Nitrogen is a limiting growth nutrient in many Pacific Northwest sites, and the surface organic layer (duff) is a primary source of nitrogen for tree growth.

Harvest systems such as clearcutting that remove the most organic material from a site and alter the soil biology have the most potential for decreasing long term soil productivity. Similarly, high intensities of site preparation (e.g., high intensity, long duration fire, clean mechanical piling) potentially have the greatest effect. The potential for long term soil productivity losses is greatest when harvesting and/or site preparation activities are most frequent. Intensities of harvesting and site preparation activities are designed to minimize soil damage (see Chapter 2, Management Direction Common To All Alternatives and Appendix F).

Underburning, a method to reduce the risk of wildfires, would occur in all alternatives except Alternative A and the NA Alternative. Any adverse effects to soil productivity that could occur during underburning would be less than those caused by broadcast burning and much less than those caused by wildfire. In most instances, prescribed burning would be avoided on highly sensitive soils. On other soils, burn prescriptions would be designed to protect beneficial soil properties and would result in moderate and low intensity burns.

Varying amounts of coarse woody debris would be left on-site depending on the type of harvest and site preparation. If adequate coarse woody debris is not retained, long term soil productivity may be decreased.

Differences in management practices used, acres harvested, and acres of site preparation between alternatives are the most direct indicators of relative risk to soil productivity decreases due to organic matter reduction. However, if proper soil management practices are utilized as planned, soil organic matter, soil biological activity, and related long term soil productivity should be minimally effected in all alternatives.

Under Alternative A, approximately 3,600 acres would be burned using prescribed fire and approximately 140 acres would be machine piled.

Under Alternative E over 700 acres would be burned using prescribed fire and less than 20 acres would be machine piled.

Under Alternative C, no machine piling is projected and the harvest system proposed would require a very light prescribed fire regime that would maintain a structural retention system. Maintaining an overstory would provide a continuing supply of coarse woody debris and organic matter that would promote an environment conducive to biological activity and high nutrient status.

Under Alternative E and the PRMP, the least number of acres would be subject to management activities that would adversely effect soil productivity. However, clearcutting and burning are proposed on a limited number of acres in Alternative E, which could reduce nutrient availability and biological activity. In the PRMP, approximately 600 acres would be burned using prescribed fire, and approximately 50 acres would be machine piled. The harvest system proposed for the southern portion of the planning area under the PRMP, which requires green tree retention similar to Alternative C, should provide a source for coarse woody debris accumulation. Less woody debris accumulation is anticipated in the northern portion of the planning area because less trees would be retained on site following harvest. More woody debris would accumulate under Alternative C than other alternatives because the proposed rotation length would be 150 years. The other alternatives, except for the PRMP, could have rotation lengths as short as 40 years. In summary, the proposed activities in the PRMP that could have an adverse effect on soil productivity would be less than Alternatives NA, A, B, C, and D, and similar to Alternative E.

Conclusion

Alternatives A, B, and the NA Alternative would have the greatest risk of adversely effecting soil productivity due to the amount of acres impacted and the potential for BMPs to not be completely effective in maintaining productivity. Conversely, Alternative E would have the least risk of reducing long term productivity. Implementation of the PRMP would create a risk of reducing productivity that would be slightly less then Alternatives C and D and slightly more than Alternative E. For analysis purposes, it was assumed that no forest health harvest would occur in Alternatives NA, A, and B; and the acres entered for forest health related harvest would be proportional to acres intensively managed in Alternatives C, D, E, and the PRMP. Therefore, it is anticipated that the risk of decreasing soil productivity would be greater if Alternatives C or D were implemented, rather than Alternative E or the PRMP. Although management prescriptions, mitigation, and amelioration measures have been designed to keep the extent and duration of adverse effects on soils within acceptable levels, adverse effects cannot be completely eliminated. The construction of rocked and/or excavated roads, quarries, and developed recreation sites are irreversible or irretrievable commitments of the soil resource due to the long time needed to revert to natural conditions.

Effects on Water Resources

This section discusses effects of management activities of the alternatives on water quantity, water quality, and upland condition. Soil erosion is discussed in Chapter 4, Soils; stream ecosystems are discussed in Chapter 4, Riparian Zones; water quality effects on fish and wildlife are in Chapter 4, Fish; and Chapter 4, Wildlife, respectively.

Effects on stream channel stability due to management activities are influenced by changes in riparian vegetation, coarse woody debris in the stream, and streamflows. Riparian vegetation and coarse woody debris are discussed in Chapter 4, Riparian Zones. Streamflows in relation to stream channel stability are discussed in this section under water quantity.

Effects of Management

Allocations/Activities

Appendix 4-WA-1, Draft RMP, provides background information that describes effects of management activities on hydrologic processes and the resulting effects on water resources and beneficial uses. Management allocations for timber production would have the most widespread adverse effect on water resources, while allocations for riparian management areas (RMAs) or Riparian Reserves and enhancement of old growth forest characteristics (i.e. Habitat Conservation Areas, Old Growth Management Areas, Late-Successional Reserves, etc.) would have the most widespread beneficial effect on water resources. Management activities associated with timber production that could adversely effect water resources locally or on a watershed scale are road construction, ground-based yarding and site preparation, timber harvest, and prescribed burning. Management activities that could have localized adverse effects on water resources are mining, grazing, off-highway vehicle (OHV) use, facility construction, and recreation use. Effects of grazing allocations on water resources are discussed in the Grazing EIS (USDI, BLM, MDO 1984).

Effects of management actions on water resources are analyzed using information from the 10-year timber and mineral scenarios such as harvest acres, miles of road construction, acres of burning, yarding systems, and mineral development (see Table I-1 and Appendix X). The 10-year timber scenario was developed for Alternatives A-E. For the PRMP and the NA Alternative, best estimates replace the 10-year timber scenario. The amount and intensity of proposed management actions vary by alternative and were used as risk indicators to compare the direct and indirect water resource impacts between alternatives.

Local changes in hydrologic processes resulting from removal of forest vegetation tend to diminish as areas revegetate. The duration of changes in these processes is generally three to four decades and is related to vegetation characteristics such as tree height, leaf area, canopy density, and canopy closure (FSEIS page 3&4-55). On a watershed scale, as one area revegetates, another area would be harvested resulting in continual disturbance and hydrologic change. Increases in turbidity and sediment resulting from surface-disturbing activities tend to diminish as disturbed areas stabilize and revegetate. Turbidity and sediment levels would remain above predisturbance levels until the area disturbed is fully vegetated. Compacted areas would have long term adverse effects on turbidity and sediment levels and streamflows, lasting as long as the surface remained compacted.

Salvage operations and forest condition restoration thinning would be performed in accordance with best management practices (BMPs). Adverse effects of these activities on water resources are expected to be minimal for all alternatives and would primarily result from surface-disturbing activities such as road construction and ground-based yarding.

Suppression of intense wildfires in RMAs or Riparian Reserves, on fragile soils, and watersheds in poor condition would minimize effects on water quality as long as fire suppression activities such as application of retardant and use of heavy equipment did not cause more damage than the wildfire. However, in the long term, continued fire suppression could allow fuels to accumulate to a level that could greatly increase the potential for a catastrophic fire that would adversely effect watershed condition.

Off-highway vehicle (OHV) limitations and closures would reduce soil erosion and water quality degradation.

Comparison of Effects by Alternative

Water Quantity

Topics covered under water quantity include peak flows, transient snow zone, and water use. No measurable changes in annual water yield, low flows, or ground water are anticipated (see Appendix 4-WA-1, Draft RMP).

Peak Flows. Increases in magnitude and frequency of peak flows could occur in small watersheds (see Chapter 3, Water Resources) as a result of timber harvest and soil compaction under all alternatives (Harr et al. 1979). Adverse effects would most likely occur in small watersheds where increased magnitude and frequency of peak flows could effect stream channel condition by eroding streambanks, scouring streambeds, and transporting sediment downstream. These stream channel impacts could result in water quality degradation and impairment of beneficial uses such as aquatic habitat and domestic use. The severity of these effects depends on the existing channel condition and would increase with reduction in recruitment of coarse woody debris to the stream channels (see Riparian Zones). The probability of increases in magnitude and frequency of peak flows occurring depend on the amount and location of disturbance, which would vary by alternative and the magnitude and frequency of storm events. Implementation of BMPs would minimize the area compacted due to road building and yarding and would disperse harvest units to avoid concentrations of unvegetated areas.

The probability of increased magnitude and frequency of peak flows and associated channel condition impacts in small watersheds would be highest under Alternatives A and B due to the amount of harvest acres, silvicultural systems utilized, acres of prescribed burning, miles of road construction, and amount of ground-based yarding.

The amount of area harvested and compacted under Alternatives NA, C, and D is less than under Alternatives A and B and would result in a lower probability of increased magnitude and frequency of peak flows and subsequent stream channel degradation in small watersheds than Alternatives A and B. More regeneration harvest would occur under the NA Alternative than Alternatives C and D, however, miles of road construction are higher for Alternatives C and D than the NA Alternative. Harvest intensity varies by silvicultural system, which varies by alternative. Harvest intensity would be highest under the NA Alternative, less under Alternative D, and lowest for Alternative C.

Alternative E and the PRMP would have the lowest probability of increasing magnitude and frequency of peak flows due to low miles of road construction and the least number of acres harvested, burned, and tractor logged. Greater riparian protection under Alternative E and the PRMP would provide more coarse woody debris recruitment to reduce the damaging effects of peak flows. The probability for peak flow increases would be greatly reduced in watersheds allocated to Late-Successional Reserves under the PRMP. Under Alternative E, the large amount of land unavailable for timber harvest would greatly reduce the probability for peak flow increases in most watersheds. Alternative E and the PRMP would have the least potential for adverse effects on channel condition resulting from increased magnitude and frequency of peak flows.

Transient Snow Zone. The acres of regeneration harvest in the transient snow zone (TSZ) are assumed to be a relative proportion of the total acres estimated for regeneration harvest in each alternative. The probability for increases in the magnitude and frequency of peak flows, due to openings in the transient snow zone, would be greatest for Alternatives NA, A, and B due to the large number of harvest acres estimated for the decade and the even-aged silvicultural system proposed. Fewer harvest acres under Alternatives C and D would result in fewer openings in the transient snow zone and the likelihood of increases in magnitude and frequency of peak flows due to unrecovered openings in the transient snow zone would be less. The structural retention system for Alternative C and the partial cutting prescription for Alternative D would provide greater canopy cover than the even-aged silvicultural system. The PRMP and Alternative E would have the smallest impact on the transient snow zone due to the number of harvest acres, the PRMP's structural retention silvicultural system in the southern general forest management area (SGFMA), and the shelterwood retention system used on the restricted forest management area under Alternative E.

Water Use. Water use for road construction would be highest under Alternatives A, B, and D; slightly less for the NA and Alternative C; and substantially less for the PRMP and Alternative E based on the miles of new road construction. The demand for water under all alternatives, but especially A, B, and D, could conflict with existing levels of appropriations, including minimum streamflows and restrictions on appropriations. For situations where water is unavailable, water needed for road operations could be transported long distances at a higher cost.

Water Quantity Summary. Probability of increases in magnitude and frequency of peak flows and subsequent adverse effects on stream channel condition due to timber harvest, soil compaction, and openings in the transient snow zone is highest for Alternatives A and B followed by the NA, C, and D, and lowest for E and the PRMP. No measurable changes in annual water yield, low flows, or ground water are anticipated for any of the alternatives.

Water use needed for road construction would progressively decrease in order from Alternatives A, B, D, NA, C, E, and the PRMP. Alternatives with higher water use would have greater potential for conflicts with other water use demands.

Water Quality

Subjects discussed under water quality include water temperature, turbidity and sediment, chemicals and nutrients, water quality limited streams, community water systems, and lakes and reservoirs.

Under all alternatives, BMPs are designed to mitigate adverse effects while meeting other resource management objectives. RMAs and Riparian Reserves are designed to protect, maintain, or improve water quality under all alternatives, except the NA Alternative. Under the NA Alternative, RMAs are only established along fishery streams.

The effects to water quality under the alternatives vary depending on the acreages and distribution of the various land allocations and the type and location of land-disturbing activities occurring under the alternative. The most significant factors related to potential water quality effects for each alternative are the size of RMAs or Riparian Reserves, the level and location of road building, and the amount and method of timber harvest permitted (FSEIS page 3&4-107).

The analyses and conclusions regarding water quality in the FSEIS have been incorporated in the PRMP impact analysis. Alternative 9 of the FSEIS was essentially adopted in the SEIS ROD, which in turn has been incorporated into the PRMP.

It is assumed for analysis that an average RMA width of 75 feet is adequate for meeting state regulations for temperature and turbidity (Brazier and Brown 1973; Beschta et al. 1987). A 75-foot RMA would likely provide sufficient shade from streamside vegetation to prevent water temperature increases and allow a vegetative strip to filter sediment from surface-disturbing activities adjacent to an RMA. However, a 75-foot RMA would not be adequate to protect or maintain stream and riparian ecosystems, which could have detrimental long term effects on water quality (see Riparian Zones).

Water Temperature. Water temperatures of perennial streams would be maintained or reduced under all alternatives, except the NA Alternative. The NA Alternative would not provide adequate stream shading for all perennial nonfishery streams because it allows removal of conifers adjacent to these streams. Conifers removed along perennial nonfishery streams with sparse understory vegetation would result in increased water temperatures (Andrus and Lorensen 1992). It is likely that the NA Alternative would not meet the state water temperature criteria for all perennial nonfishery streams. Summer maximum temperatures in all perennial streams would likely be maintained by RMA widths under Alternatives A and B and reduced under Alternatives C, D, E, and the PRMP due to RMA or Riparian Reserve widths. A reduction in summer maximum temperatures would improve water quality and aquatic habitat and thus enhance beneficial uses such as domestic water and fish. Under all alternatives, the ability to maintain or reduce summer maximum temperatures would be directly influenced by upstream activities on non-BLM-administered lands.

Turbidity and Sediment. Implementation of RMAs or Riparian Reserves and BMPs would reduce the potential for surface erosion, however, surface-disturbing activities under all alternatives could result in increased turbidity and sediment levels. Increases in turbidity and sediment levels would adversely effect water quality and could impair beneficial uses such as fish and domestic water use. Sources of sediment include existing and new haul and skid roads, mechanical site preparation, timber harvest and broadcast burning along first and second order streams without RMAs, surface-disturbing activities on fragile soils, and surface disturbance from mining operations. Increases in turbidity and sedimentation could also result from increases in the magnitude and frequency of peak flows as previously discussed.

Effects of management activities on coarse woody debris and subsequent changes in levels of turbidity and sediment are addressed in Riparian Zones.

The major source of turbidity and sedimentation increases would be from road construction. Miles of road construction and associated risk of increased turbidity and sedimentation would be highest under Alternatives D, A, and B; less under Alternatives NA and C; and substantially less under Alternative E and the PRMP (see Table 4-I-1). Total miles of new roads under Alternatives A, B, and D would be about the same; however, Alternative D would have more miles of unsurfaced road than Alternatives A and B and would result in greater turbidity and sediment increases.

Surface disturbance resulting from ground-based yarding and mechanical site preparation would also contribute to increases in turbidity and sediment levels. Based upon the 10-year timber scenario (and best estimates for NA and PRMP), the potential for increases in turbidity and sediment levels would be greatest for Alternatives A, B, and the NA; less for Alternatives C and D; and least for Alternative E and the PRMP.

The potential for increases in turbidity and sediment levels due to increased magnitude and frequency of peak flows is highest under Alternatives A and B; less under Alternatives NA, C, and D; and lowest for Alternative E and the PRMP based on the analysis in the water quantity section.

Because RMAs and Riparian Reserves for third order and larger streams would sufficiently filter sediment, the following discussion only addresses effects on first and second order streams.

First and second order streams comprise approximately 79 percent of stream miles on BLM-administered land. Table 2-1 identifies management of these streams by alternative. It is assumed that the Riparian Reserves under the PRMP would protect all first and second order streams. Under the other alternatives, RMAs would protect the estimated seven percent of first and second order streams that are perennial or support fish.

Under all alternatives except the PRMP and E, timber harvest and broadcast burning along first and second order streams without RMAs could have widespread adverse effects on turbidity and sediment levels. Because these first and second order streams comprise approximately 73 percent of stream miles on BLM-administered land, these streams would receive minimal streamside protection. These streams are able to transport sediment downstream.

The vegetative strip left along first and second order streams without RMAs is intended to filter sediment from surface-disturbing activities that occur upslope and to provide a green strip that would reduce intensity of fires entering this streamside area from prescribed burns in adjacent harvest units. However, success of this vegetative strip in filtering sediment and reducing fire intensities would depend on the amount of vegetation existing after harvest operations. Survival of this vegetation during a logging operation would depend on the amount, size, and type of vegetation existing prior to harvest, yarding method, number of trees harvested in the streamside area, and steepness of sideslopes. It is likely that a large percentage of these first and second order streams would not have a sufficient amount of vegetation either prior to or following a harvest operation to provide a sediment filter or to reduce fire intensity. Increased sediment loads in first and second order streams would be transported downstream to larger order streams. The degree and magnitude to which this would occur however, is unknown.

The even-aged silvicultural system proposed under Alternatives NA, A, and B would have the greatest potential for adversely effecting vegetation along first and second order intermittent streams. More acres would be harvested for regeneration and broadcast burned under Alternatives NA, A, and B than under the other alternatives; therefore, they would have a higher risk of increasing turbidity and sediment levels in more first and second order streams than the other alternatives.

Under Alternatives C and D, first and second order intermittent streams would receive more protection and consequently less risk of increasing turbidity and sediment levels than under Alternatives NA, A, and B. This is due to RMAs along second order intermittent streams under Alternative D, and implementation of partial retention silvicultural systems on a portion (Alternatives D) or all (Alternative C) of the lands available for timber harvest. The PRMP and Alternative E would provide the greatest protection of first and second order intermittent streams. For first and second order streams adjacent to harvest units, the PRMP would afford greater protection than Alternative E. Overall, Alternative E would protect more first and second order intermittent streams because of the large area unavailable for harvest and the small acreage designated for even-aged stand regeneration. In summary, turbidity and sediment increases in first and second order streams that

Table 4-I-1. Estimated Annual First Decade Levels of Timber Management Activity by Alternative

Activity[1]	NA	A	B	C	D	E	PRMP
Regeneration	4,800	6,100	5,700	3,500	3,000	1,300	4,300
Woodlands harvest	0	580	430	0	0	0	0
Road construction (Miles)	60	70	70	60	70	20	40
Road construction (Acres)	320	370	380	340	380	120	220
Overstory removal	2,200	2,000	1,900	230	730	280	300
Commercial thinning/Density management	950	1,200	1,200	740	680	250	2,000
Ground-based yarding	1,800	2,200	2,000	800	1,100	360	1,700
Cable yarding, no suspension	1,400	1,700	1,600	360	530	20	0
Cable yarding, partial suspension	4,300	5,000	4,800	2,700	2,100	1,100	3,300
Aerial yarding (Helicopter)	400	370	450	700	660	360	1,600
Site preparation:							
Prescribed burning	2,800	3,600	3,400	2,100	1,800	750	2,400
Other	520	640	600	290	330	130	440
Release/Precommercial thinning	7,800	7,800	7,800	7,800	5,000	1,100	7,800
Brushfield/Hardwood conversion	0	800	800	0	530	10	0
Planting/Regular stock	1,400	4,000	3,600	2,200	880	320	1,000
Planting/Genetically selected stock	4,600	4,600	4,600	2,200	3,500	1,300	4,100
Fertilization	5,700	5,700	5,700	5,700	3,700	790	5,700
Maintenance/Protection	11,700	16,700	15,900	8,600	8,500	3,100	10,400
Pruning	1,700	1,900	1,700	1,400	1,200	260	1,860
Underburning for maintenance of stand structure	0	0	0	400	0	0	300

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[1] Estimates are derived from representative 10-year timber management scenarios and other sources.

result from timber harvest and broadcast burning would be most likely to occur under Alternatives NA, A, and B; less likely under Alternatives C and D; and least likely under Alternative E and the PRMP.

Alternatives NA and A would have the greatest impact on fragile surface erosion and landslide soils due to the number of harvest acres and the even-aged silvicultural system prescription. Alternative B would impact a similar number of acres on fragile surface erosion and landslide soils, but prescribes the shelterwood retention silvicultural system that would result in less surface disturbance. Alternatives C and D would impact fewer acres of fragile surface erosion and landslide soils than Alternatives A, B, and the NA and would utilize silvicultural systems (structural and shelterwood retention) to minimize soil disturbance. Alternative C minimizes new road construction on fragile surface erosion and landslide soils. Alternative D limits all surface-disturbing activities on fragile surface erosion and landslide soils. The PRMP impacts less acres of fragile surface erosion and landslide soils than all other alternatives except E. The structural retention silvicultural system would be implemented on fragile surface erosion soils, and the shelterwood retention silvicultural system would be prescribed for fragile landslide soils to minimize surface disturbance that result from timber harvest. Alternative E excludes timber harvest on fragile gradient and surface erosion soils, limits surface disturbing activities on fragile landslide soils, and prescribes the shelterwood retention silvicultural system on fragile landslide soils.

Levels of mineral exploration and development would be the same under all alternatives (see Appendix X). Mineral exploration and development would be conducted in accordance with BMPs. However, existing mining laws allow mining activities in RMAs or Riparian Reserves. Any surface-disturbing mining activity that would occur within an RMA, Riparian Reserve, or floodplain would have a high probability of increasing turbidity and sedimentation to levels that would degrade water quality.

The 50 bench placer operations forecast under the 10-year mineral scenario would have the greatest likelihood of increasing turbidity and sediment to unacceptable levels. The one open pit chemical leaching operation projected under the 10-year mineral scenario could result in excavating and stockpiling a large amount of overburden material, which could cause substantial localized increases in turbidity and sedimentation.

Turbidity and Sediment Summary. Potential for increases in stream turbidity and sedimentation due to all surface-disturbing activities would be highest under Alternatives A and B; and lowest for Alternative E and the PRMP, with Alternatives NA, D, and C grouped in between. Alternative E and the PRMP would result in the smallest increase in turbidity and sedimentation because they would construct the fewest miles of road, involve the fewest acres of ground-based yarding, exclude timber harvest (Alternative E) or utilize the structural retention silvicultural system (the PRMP) on fragile surface erosion soils, and have RMAs or Riparian Reserves along all streams.

Chemicals and Nutrients. Changes in the presence and concentration of chemicals found in forest streams could occur under all alternatives as a result of broadcast burning, fertilization, herbicide and pesticide application, use of fire retardant, and tailings from mining operations. However, changes in chemical composition that would degrade water quality or effect beneficial uses would be unlikely under any alternative. All alternatives would implement BMPs during chemical applications. The risk of ground water or surface water contamination resulting from accidental spills or improper use is anticipated to be low for all alternatives but could increase with higher levels of timber management and mineral development.

Open pit chemical leaching would be the mining operation most likely to adversely effect chemical composition. One small leaching operation, disturbing approximately 25 acres, is forecast for the short term under all alternatives. Although localized, it could potentially have severe effects on ground water and surface water quality. BMPs would reduce the potential for water quality impacts, however, cyanide could be transported to streams and ground water through surface runoff during storm events and leached into the water table. Introduction of cyanide in streams and ground water would have toxic effects on beneficial uses such as domestic water and fish.

Water Quality Limited Streams. Bear Creek, Little Butte Creek, and Evans Creek are the only streams in the planning area identified by ODEQ as "water quality limited" (see Chapter 3, Water Resources). A total maximum daily load (TMDL) for phosphorus in Bear Creek has been set by the Environmental Quality Commission. It is anticipated that compliance with appropriate phosphorus limits in Bear Creek from BLM-associated activities would be achieved under all alternatives through BMPs. No waste load allocations have been proposed for Little Butte Creek or Evans Creek.

Community Water Systems. The level of water quality protection under the PRMP should benefit community water systems within and downstream from BLM-administered lands. Although additional PRMP analyses will be needed to assess the effects of site-specific projects on water supply systems, the Riparian Reserves and other components of the Aquatic Conservation Strategy under the PRMP should contribute to the ability of water systems to remain unfiltered and comply with Safe Drinking Water Act requirements (FSEIS page 3&4-107).

Based upon the 10-year timber scenario for Alternatives A-E, there would be a low probability of any community water systems being adversely effected by timber harvest and road construction under all alternatives except Alternatives C and D, which could adversely effect the Talent community water system (Wagner Creek source).

It is not possible to predict whether other surface-disturbing activities, such as mining, would occur in a tributary to a community water system. An open pit chemical leaching operation could have severe effects on the water quality of any community water system located downstream.

Based upon the 10-year timber scenario for Alternatives A-E, the potential to adversely effect water quality of the Wagner Creek source of the Talent community water system due to proposed harvest acres and amount of road construction would be most likely for Alternatives C and D, less likely for B, and least likely for A and E. Miles of road construction are substantially greater under Alternatives C and D than the other alternatives. Effects of timber harvest would be moderated due to implementation of the structural retention system for Alternative C and the partial cutting prescription for Alternative D. Under Alternative D (also E and the PRMP), a management plan would be prepared for the Wagner Creek source of Talent community water system to identify methods that would mitigate adverse effects on water quality, such as utilizing aerial logging to reduce miles of road construction. Alternatives C and D could result in increased treatment costs due to higher turbidity and sediment levels.

Lakes and Reservoirs. The potential for adverse effects of management activities on lakes and reservoirs exists for all alternatives and increases with narrower RMAs and higher levels of turbidity and sediment entering from upstream sources. Adverse effects on lakes and reservoirs would be most likely under Alternatives NA, A, and B, due to narrower RMAs and greater increases in turbidity and sedimentation; less likely under Alternatives C and D; and much less likely under E and the PRMP. Based upon the 10-year timber scenario for Alternatives A-E, Alternatives A and B would have the greatest potential to adversely effect Parsnip Lake, due to the amount of road construction and timber harvest proposed.

Water Quality Summary. Summer maximum water temperatures would likely increase in some perennial nonfishery streams under the NA Alternative; be maintained in all perennial streams under Alternatives A and B, and be reduced in all perennial streams under Alternatives C, D, E, and the PRMP. Implementation of RMAs or Riparian Reserves and BMPs would reduce the potential for surface erosion, however, surface-disturbing activities under all alternatives could result in increased turbidity and sediment levels. Alternatives A and B would result in the highest potential for increases in stream turbidity and sedimentation; followed by Alternatives NA, D, and C; with the lowest potential for increases resulting from Alternative E and the PRMP. Changes in chemical composition that would degrade water quality or effect beneficial uses are unlikely under any alternative. Treatment costs for sediment filtering could increase under Alternatives C and D for the Talent community water system (Wagner Creek source). Adverse effects on lakes and reservoirs would be most likely under Alternatives NA, A, and B; less likely under Alternatives C and D; and much less likely under E and the PRMP.

Cumulative impacts to water quality differ among the alternatives primarily as a function of the alternatives' proposed level of land disturbance and Aquatic Conservation Strategy adoption (FSEIS page 3&4-107). The broad scale application of the Aquatic Conservation Strategy in the PRMP and RMA widths and the limited amount of land available for harvest under Alternative E will significantly reduce the potential of adverse cumulative impacts to water quality compared to Alternatives NA-D.

Upland Condition

The quantity and quality of water in a stream system is a reflection of both riparian and upland conditions in a watershed. Best management practices, allocation of lands not available for timber harvest, and watershed restoration efforts would contribute to the maintenance and improvement of upland conditions.

BMPs for Alternatives NA-E include RMAs, which vary by alternative. BMPs for the PRMP incorporate Riparian Reserves, watershed analysis, and watershed restoration from the Aquatic Conservation Strategy. The success of site-specific projects in maintaining hydrologic functions and meeting water quality standards depend on the effectiveness of the BMPs. The application of BMPs alone cannot ensure that water quality standards are being met. An iterative process consisting of design, implementation and effectiveness monitoring, evaluation, and adjustment would be used for validating and, where appropriate, revising BMPs.

Allocation of lands not available for harvest varies by alternative as shown on Table S-1. Alternatives A and B have the smallest number of acres within the planning area that are not available for harvest (28 and 35 percent respectively). Alternatives NA and C have 48 and 53, percent respectively. The PRMP and Alternative D have 59 and 60 percent, respectively, of lands not available for harvest. Alternative E has the largest number of acres of land not available for timber harvest (91 percent). Alternative E would provide the greatest protection for upland conditions because management activities would only occur on 9 percent of BLM-administered lands within the planning area.

Watershed restoration emphasis varies by alternative. Alternatives NA, A, B, and C do not include management direction for watershed restoration. Alternative D identifies 22 priority watersheds for restoring and/or maintaining water quality. Alternative E highlights 37 priority watersheds for water quality restoration plans. The PRMP incorporates the watershed restoration component of the Aquatic Conservation Strategy. Watershed restoration under the PRMP is a comprehensive, long term program to restore watershed health and aquatic ecosystems.

In summary, upland condition on BLM-administered lands would most likely be degraded under Alternatives A and B; maintained under Alternatives NA and C; and improve under Alternatives D, E, and the PRMP. Watershed recovery rates would be quickest for Alternatives D, E, and the PRMP.

Cumulative impacts on upland conditions would include impacts from other federal lands and nonfederal lands. Other federal lands will be managed under a scenario that incorporates the Aquatic Conservation Strategy. State, county, and private forestlands comprise the majority of nonfederal lands. These lands would be managed according to the Oregon Forest Practices Rules, which may be revised to provide increased water quality protection. The cumulative impact comparison between alternatives would be similar to the comparison based on direct and indirect impacts.

Conclusion

Implementation of BMPs and allocations to RMAs or Riparian Reserves under all alternatives would greatly mitigate potential adverse effects of management activities on water resources, however, adverse effects would not be totally eliminated. Management allocations for timber production and associated road construction would have the most widespread adverse effect on water resources. Allocations for RMAs or Riparian Reserves and enhancement of old growth forest characteristics would have the most widespread beneficial effect on water resources. Subsequent analysis at the watershed and site-specific levels will be needed to support development and implementation of water quality protection measures (FSEIS page 3&4-107).

The primary effect on water quantity due to management actions under the alternatives would be increased magnitude and frequency of peak flows. Stream channel condition could be adversely effected by increases in magnitude and frequency of peak flows, with the highest probability of this occurring under Alternatives A and B; followed by Alternatives NA, C, and D; and the lowest probability for adverse channel effects under Alternative E and PRMP.

The greatest potential for water quality impacts would occur under Alternatives A and B followed in decreasing order by NA, D, and C. Alternative E and the PRMP are expected to maintain or improve water quality based on the Riparian Reserves and other components of the Aquatic Conservation Strategy under the PRMP and the RMAs and limited land available for timber harvest under Alternative E.

Upland conditions would most likely decline under Alternatives A and B; be maintained under Alternatives NA and C; and improve under Alternatives D, E, and the PRMP. BMPs, allocation of lands not available for timber harvest, and watershed restoration efforts would contribute to the maintenance and improvement of upland conditions.

In the long term, it is assumed the relative effects of the alternatives would be similar to those described for the short term.

The riparian and watershed enhancement activities proposed under Alternatives D, E, and the PRMP would improve long term water quality and watershed condition by increasing shading vegetation, stabilizing eroding streambanks and roads, and establishing vegetative cover on disturbed sites. Water quality in areas unavailable for timber harvest and restricted from surface-disturbing activities would be maintained in the short term and would likely improve in the long term.

Effects on Biological Diversity

Short and long term effects of the alternatives on the biological diversity of ecosystems are analyzed through comparing with existing conditions and where possible, with the conditions that existed before grazing, logging, and fire suppression began. While the model provided by nature provides the best indicator of conditions conducive to the survival of species, uncertainty exists about the original condition of stands and landscapes.

The alternatives vary substantially in their potential effects on ecosystems.

- They create a different balance between seral stages, especially the relative abundance of younger and older seral stages.
- They employ various silvicultural systems which produce stands of differing stand structure, each having associated effects on ecological processes, genetic diversity, and ecosystem stability.
- They employ different land use allocations and rotation lengths, which would interact to produce different arrangements of stands in landscapes and different levels of habitat fragmentation.
- They result in differences in species richness and relative abundance of species.
- They affect specific plant communities and ecosystems differently.

Some of the effects would be minor, especially for species with large or widespread populations. Risk of loss would be greater for species which are rare, limited to specific habitat types, or are concentrated in limited geographic areas. Of the activities considered in this plan, timber management activities would have the greatest potential to change the biological diversity of ecosystems within the planning area.

Seral Diversity

The best indicator of how well management allocations under the alternatives maintain or enhance biological diversity on BLM-administered land is the degree to which a balanced mixture of seral stages would be retained or created. Because the planning area contains large amounts of privately-owned land, an optimum mixture of seral stages on BLM-administered land may not be optimum for the landscape.

Figures 4-BD-1 and 4-BD-2 show the seral stage distribution for BLM-administered forestland that currently exists and would exist under each alternative in ten years and in 100 years. Seral diversity analyses contained in this document considered the mature stage to begin at the approximate age of 101 years (see Vegetation, Chapter 3). Analyses with different assumptions would produce different results. For example, analyses that assumed the mature stage to begin at 80 years (which is consistent with the FSEIS) would produce greater amounts of mature and old growth than those that assumed 100 years, therefore, estimates of late-successional acreage in this document are conservative when compared to those for the FSEIS.

In the short term (ten years), Alternatives C, D, E, and the PRMP would result in the least change in seral stage diversity from what currently exists; while Alternatives NA, A, and B would result in a noticeable shift toward earlier seral stages. In the long term (100 years), all alternatives would be substantially different than the existing condition. Alternatives NA, A, and B would result in a large shift toward earlier seral stages. Alternatives C, D, E, and the PRMP would result in a net shift toward later seral stages. These shifts are evident in Figure 4-BD-3, which shows the ratio of mature and old growth seral acres to early and mid-seral stage acres.

In the short term, Alternatives NA, A, and B would result in substantial decreases in the ratio of older stands to younger stands within the total forest landscape. All other alternatives would result in more moderate changes in the relative abundance of seral stages, with the PRMP showing the least change.

In the long term, Alternatives NA, A, and B would result in a substantial shift in seral balance toward younger stands. While all other alternatives would result in an increase in the ratio of older forest to younger forests and would more closely approximate the balance of seral stages which is thought to have existed on BLM-administered land prior to grazing, logging, and fire suppression.

Under Alternatives NA, A, B, D, and E, silvicultural practices would shorten the duration of open, early seral stages and the time harvest units are

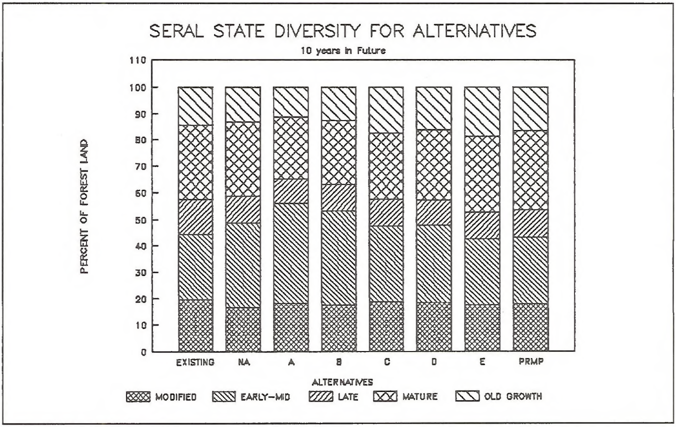

Figure 4-BD-1. Seral State Diversity for Alternatives –10 years in future

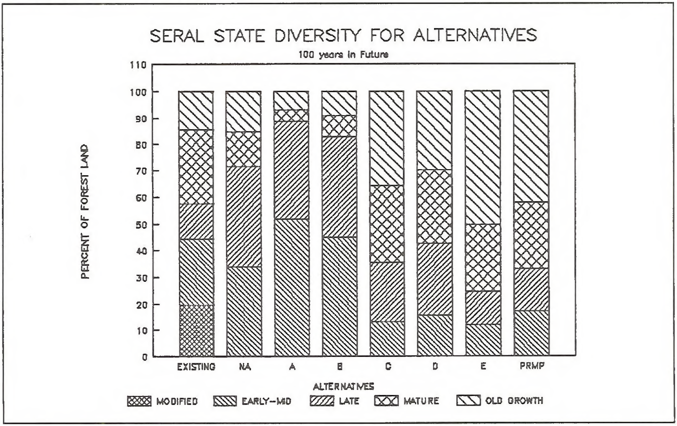

Figure 4-BD-2. Seral State Diversity for Alternatives –100 years in future

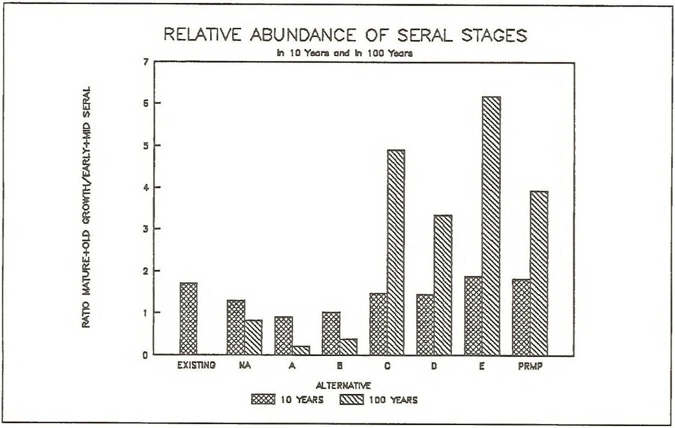

***Figure 4-BD-3.** Relative Abundance of Seral Stages – In 10 years and in 100 years*

dominated by grasses, forbs, and shrubs. Fertilization and genetic tree selection would accelerate tree growth compared to the natural condition and reduce the duration of early, mid- and late seral stages. Under Alternative C, and to a lesser extent, under the PRMP, silvicultural practices would maintain seral stage lengths closer to natural condition through control of stand density and other practices which would lead to more complex stand structures and natural ecosystem functions.

The relative abundance of mature and old growth seral stages which would exist under each alternative expressed as a percent of total forestland for 10, 20, 30, and 100-years in the future is shown in Figure 4-BD-4. Alternatives NA, A, and B show a decreasing trend (from the existing situation) in the amount of older forest that would exist; Alternative D shows a moderate increase; and Alternatives C, E, and the PRMP shows a substantial increase over the long term.

Acres of land meeting old growth definitions projected for BLM-administered land in the planning area for both the short and long term are shown in Table 4-BD-1. These acres include old growth projected to occur on both land allocated to timber management and not allocated to timber management.

Compared to the approximate 102,000 acres of old growth that currently exists on BLM-administered land in the planning area, Alternatives C, D, E, and the PRMP would eventually result in increases in old growth. Alternative E would result in the greatest amount of old growth in approximately 100 years. Under Alternatives NA, A, and B, old growth would decrease.

The number of mature and old growth acres projected to be harvested under each alternative are shown in Table 4-BD-2.

Silvicultural systems affect the time necessary for a stand to achieve old growth characteristics (PNW-447 or PNW-GTR-285). For even-aged regimes, shelterwood-retention regimes, or modified even-aged regimes used in Alternatives NA, A, B, D, E and the northern GFMA of the PRMP, old growth structural characteristics are assumed to develop in 200 years. However, rotation lengths of less than 200 years for these alternatives would prevent old growth from being reached.

Under Alternative C and the southern GFMA under the PRMP, old growth structural characteristics would be attained at earlier ages. For the low retention

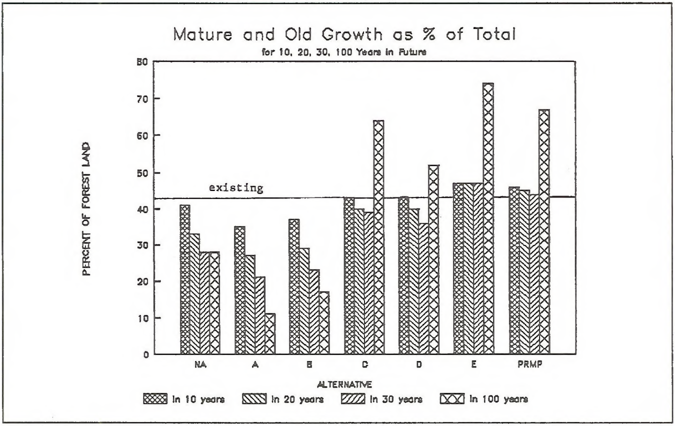

Figure 4-BD-4. Mature and Old Growth as % of Total

Table 4-BD-1. Projected Old Growth Habitat (Acres)

	NA	A	B	C	D	E	PRMP
Old growth (10 years)	87,000	77,000	86,000	115,000	107,000	124,000	107,000
Old growth (100 years)	99,000	62,000	88,000	288,000	176,000	339,000	274,600

Table 4-BD-2. Projected Regeneration and Overstory Removal Harvests of Mature and Old Growth For the Next Decade (Acres)

	NA	A[1]	B[1]	C	D	E	PRMP
Mature	12,600	43,700	40,800	27,800	25,100	9,600	8,100
Old growth	55,200	43,100	39,500	9,500	7,800	0[2]	3,300
Total	67,800	86,800	80,300	37,300	32,900	9,600	11,400

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[1] Includes harvest in woodlands.

[2] It is assumed that less than 100 acres of old growth would be harvested for right of ways, quarries, etc.

systems under Alternative C and the southern GFMA system for the PRMP, modeling indicates that old growth habitat conditions would be attained in approximately 100 years following regeneration harvest and could also be produced from density/thinning management. For the high-retention regimes used in Alternative C, a minimum of 40 percent of the landscape would meet old growth definitions at any one time. The combination of the use of these regimes with retention of older seral stages would result in a higher proportion of the landscape in Alternatives C and the PRMP meeting old growth definitions than would be indicated by stand age alone. Under the regimes proposed for Alternative C, 92,700 acres of managed stands would attain old growth definitions in 100 years, an increase of 48 percent in old growth over what would be available based on age alone in the total landscape.

At the subregional level (defined as the Medford BLM District, the Rogue National Forest, the Siskiyou National Forest, and intermingled industrial timber lands), approximately 594,000 acres of old growth currently exist on federal land. Under the PRMP and the Rogue and Siskiyou forest plans, an estimated 425,000 cumulative acres of old growth forests would exist in 10 years. Little or no old growth is likely to exist on private land.

In the short term, the percent change from existing old growth on federal lands in southwestern Oregon attributed to BLM allocations would be a decrease of 3 to 5 percent for Alternatives NA, A and B; an increase of 1 percent for Alternatives D and the PRMP; an increase of 2 percent for C; and an increase of 4 percent for Alternative E. (See Table 4-BD-1 for the amount of old growth projected to exist in 10 and 100 years on BLM-administered land under each of the alternatives.)

In western Oregon, the Forest Service and the Wilderness Society have identified about 1.9 million acres of old growth forest remaining on national forestland. These 1.9 million acres and the approximately 400,000 acres of old growth forest on BLM-administered lands represent approximately 15 percent of all western Oregon forestland. In contrast, it has been estimated that prior to historic settlement, 60 to 70 percent (the amount was not static but fluctuated) of western Oregon and Washington forests were old growth (Franklin and Spies 1984). One study shows only 40 percent of most of the Oregon Coast Range was old growth in 1850 (Teensma et al. 1991). The Regional Ecosystem Assessment Project (REAP) completed in 1993 by the U.S. Forest Service estimated that 45 to 75 percent landscape existed in late-successional condition, historically.

For the Medford District, Alternatives C, E, and the PRMP are projected to have levels of late-successional forest within the historic range estimated by the REAP report. Alternative E and the PRMP are projected to have old growth above the 40 percent historic level by Teensma et al. 1991.

Structural and Functional Diversity

The different silvicultural systems used under each alternative strongly influence stand structure through the amount and kind of dead and living structures retained after regeneration harvest, by the design of density management (thinning) harvests, and by silvicultural treatments which influence the developmental pathway the stand would follow. See Chapter 2, Timber Resources; Appendices 2-T-1, Draft RMP; and Appendix K for a description of silvicultural systems and practices.

Table 4-BD-3 displays stand structural characteristics of unentered older stands in the planning area.

Tables 4-BD-4, 4-BD-5, 4-BD-6, 4-BD-7, and 4-BD-8 show structural characteristics that modeling indicates would be produced at selected ages for the alternatives.

Most stands produced under Alternatives NA, A, and B would have one canopy level (even-aged) with no trees reaching 30-inches in diameters within 100 years. Despite retention of some snags in harvesting, the number of snags over 15-inches in diameter would reach a low point near zero from 40 to 60 years after regeneration harvest due to snags falling down with age. Numbers of snags would then increase to numbers similar to that found in older unmanaged stands as mortality occurred in the young stand. However, large snags would be absent. Coarse woody debris would fall to less than half of the level found in older natural stands.

Silvicultural systems employed under Alternative D would produce more complex stands, which would be either even-aged or two-storied during part of the rotation but would have no or few very large trees (over 30-inches). Numbers of snags and levels of down woody debris would be somewhat higher than Alternatives NA, A, and B.

Stands managed for timber under Alternative E would be similar to those under Alternative D, except after

Table 4-BD-3. Existing Structural Characteristics of Older Stands (100 years and greater)

Unentered State	Snags >15" (no.)	Coarse Woody Debris (tons)[1]	Large Green Trees (no.)		Canopy Closure in 11"+ (%)	Canopy Layers (no.)	Basal Area (sq.ft.)
			>20"	>30"			
Josephine SYU							
Mean	3.6	4.9	-	11.5	91	2.4	280.0
Standard Deviation	5.9	16.1	-	8.4	17	.9	
Jackson SYU							
Mean	4.0	4.9	-	8.5	85	2.6	240.0
Standard Deviation	6.6	12.1	-	4.4	18	.8	
Klamath SYU							
Mean	7.2	8.9	-	10.4	85	2.1	240.0
Standard Deviation	18.4	13.5	-	6.8	24	.7	

[1] Greater than 16 inches in diameter and 16 feet long.

Table 4-BD-4. Structural Characteristics by Age-Class Resulting From Even-Aged Systems used for Alternatives NA, A, and B

Forest Matrix Affected By Management (Per Acre Analysis)

Year After Regeneration Entry	Snags >15" (no.)	Coarse Woody Debris (tons)[1]	Large Green Trees (no.)		Canopy Closure in 11"+ (%)	Canopy Layers (no.)	Basal Area (sq.ft.)
			>20"	>30"			
0	2.0	8.2	0.0	0.0	0	1	0.0
40	0.2	3.4	0.0	0.0	40	1	187.8
80	3.1	1.5	48.0	0.0	100	1	245.4
100	4.3	2.2	66.7	0.0	100	1	284.6

[1] Greater than 16 inches in diameter and 16 feet long.

the removal of overstory trees, the stands would essentially be single canopy. Harvest units would contain clumps of older trees left for wildlife purposes.

Silvicultural systems employed under Alternative C and the PRMP would result in the development of more complex stand structures with multiple canopy levels. Snag numbers and levels of down woody debris would generally be higher than in other alternatives and would be present during the entire rotation. Snag numbers in most seral stages would be similar to those found in natural stands. Down wood levels would generally be near or above the levels currently found in natural older stands.

The comparison of functional relationships between the alternatives are similar to that for structural

Table 4-BD-5. Structural Characteristics by Age-Class Resulting from Silvicultural Systems for Alternative C

Forest Matrix Affected By Management (Per Acre Analysis)

Year After Regeneration Entry	Snags >15" (no.)	Coarse Woody Debris (tons)[1]	Large Green Trees (no.)		Canopy Closure in 11"+ (%)	Canopy Layers (no.)	Basal Area (sq.ft.)
			>20"	>30"			
High Retention							
0	2.0	6.3	18.5	6.0	61	2+	76.0
40	1.9	5.3	22.2	12.9	82	2+	79.6
80	1.9	5.9	15.9	10.7	83	2+	163.6
100	1.8	7.6	11.6	8.8	87	2+	175.5
150	1.8	7.0	4.5	10.6	82	2+	71.6
Low Retention							
0	2.0	6.2	19.5	8.3	31	1	00.0
40	2.4	6.0	17.8	17.8	62	1+	140.0
80	1.9	5.7	11.8	11.8	52	2	186.3
100	1.9	6.2	11.2	11.2	100	2	223.5
150	1.8	9.5	16.6	10.0	100	2	294.1

[1] Greater than 16 inches in diameter and 16 feet long.

Table 4-BD-6. Structural Characteristics by Age-Class Resulting from Even-Aged Systems used for Alternative D

Forest Matrix Affected By Management (Per Acre Analysis)

Year After Regeneration Entry	Snags >15- (no.)	Coarse Woody Debris (tons)[1]	Large Green Tree (no.) >20"	Canopy Closure in 11- (%)	Canopy Layers (no.)	Basal Area (sq. ft.)
0	2.0	8.2	27.1	40	1	140.0
40	1.8	3.9	21.0	100	2	136.0
80	3.3	1.7	16.9	100	2	175.0
100	4.4	2.6	14.8	100	2	212.8

[1] Greater than 16 inches in diameter and 16 feet long.

Table 4-BD-7. Structural Characteristics by Age-Class Resulting from Even-Aged Systems used for Alternative E

Forest Matrix Affected By Management (Per Acre Analysis)						
Year After Regeneration Entry	Snags >15- (no.)	Coarse Woody Debris (tons)[1]	Large Green Tree (no.) >20"	Canopy Closure in 11"+ (%)	Canopy Layers (no.)	Basal Area (sq. ft.)
0	2.0	8.2	19.5	31	1	100.0
40	1.8	3.9	7.9	81	2	77.5
80	3.3	1.7	48.0	100	1	220.0
100	4.4	2.6	66.7	100	1	280.0

[1] Greater than 16 inches in diameter and 16 feet long.

Table 4-BD-8. Structural Characteristics by Age-Class Resulting from Silvicultural Systems for the PRMP

Forest Matrix Affected By Management (Per Acre Analysis)							
			Large Green Trees (no.)				
Year After Regeneration Entry	Snags >15" (no.)	Coarse Woody Debris (tons)[1]	>20"	>30"	Canopy Closure in 11"+ (%)	Canopy Layers (no.)	Basal Area (sq.ft.)
Northern GFMA							
0	2.0	8.2	7.0	7.0	10	1+	46.3
40	1.4	4.1	6.3	6.3	40	1+	200.1
80	4.5	4.9	33.6	5.5	100	1+	245.8
100	5.1	5.6	46.5	4.4	100	1+	239.3
Southern GFMA							
0	2.0	5.8	27.1	7.7	40	1+	122.0
40	2.5	5.0	12.8	9.9	80	2	100.5
80	1.7	5.6	8.8	8.8	100	2	152.3
120	2.2	4.9	22.6	7.8	100	2	242.8

[1] Greater than 16 inches and 16 feet long.

relationships. Forestland available for timber production under Alternative C and the PRMP would most resemble both current unentered or original forest conditions in retention of natural ecosystem processes. Alternatives NA, A, and B would most strongly depart from those conditions.

All silvicultural systems and practices have the potential to affect genetic diversity through selection for desired traits in thinnings, decisions on which trees to leave in partial-cut units, selection of the genotype and species to use in reforestation, and tree breeding activities (Millar et al. 1990). Silvicultural systems that retain larger numbers of green trees in harvest units, such as those used in Alternative C and in the southern regime of PRMP, are likely to most resemble natural stands in genetic diversity.

BLM's tree improvement program is designed to prevent loss of genetic diversity of the tree species improved, but the program is also designed to change the genetic component of the forest. This change would occur under all alternatives, except Alternative C, but on different proportions of the total forest landscape. It is likely the tree breeding program would increase the genetic diversity of improved species in any given stand, but would reduce diversity between stands. There would be little adverse effect on the occurrence of genes within the planning area, but the program would change the frequency with which specific genes and genotypes would be expressed (see Appendix L). Improvement of one species (Douglas-fir) could change competitive relationships between species and could result in stands with different species compositions.

Because biological diversity benefits ecosystem stability, Alternative C and the PRMP would be likely to result in ecosystems that are more stable than those produced by the other alternatives. For Alternatives NA, A, and B, risk would exist over time, for declining productivity due to the reduction of structural and functional components (Perry 1989). Within all alternatives, insect and disease-related mortality would contribute to the maintenance of structure and function.

Lower levels of stand density in Alternative C and the PRMP, emphasis on thinning in the PRMP, and proposed use of prescribed fire in both of those alternatives, could result in higher tree vigor and an increase in ecosystem stability. Effects of prescribed burning are uncertain due to smoke management requirements, and the scale of the program (approximately 15,000 acres out of approximately 859,100 acres in the planning area, of underburning for maintenance of stand structure).

Forest Fragmentation

Fragmentation of mature and old growth seral stages through harvesting could pose risks to species survival and could contribute to loss of genetic diversity within species in isolated habitat islands. The degree of risk varies among the alternatives. The greatest risk would occur under Alternatives NA and A because of high levels of even-aged harvesting and lack of specific design elements (stepping-stone blocks or corridors) to provide connectivity.

Under all alternatives, forest harvesting would have some effect on both the size of remnant patches and their isolation or spatial arrangement.

Harvesting under all alternatives, other than Alternative E, would continue the fragmentation of older forest habitats, with the highest impacts occurring in Alternatives NA, A, and B. Harvesting would tend to break up older forest blocks into smaller blocks and would temporarily increase the total number of old growth blocks under all alternatives other than E. Within the next ten years, the frequency with which older forest blocks of particular sizes occur in the landscape would not change appreciably in any alternative.

The number of blocks of old growth forest which contain interior forest habitat would change more appreciably. Very few large blocks of interior habitat would remain because of BLM's checkerboard ownership pattern under any alternative. Proposed harvests under Alternatives NA, A, and B would have substantial negative effects on the number of interior old growth blocks of all sizes. Alternatives C, D, and the PRMP would have a smaller negative effect, and little change would occur under Alternative E.

Under all alternatives, many of the blocks identified would be dissected by roads. The effect of existing and possible future roads has not been considered in identification of interior habitat, but they would clearly diminish the quality of the habitat in these blocks.

See Chapter 4, Wildlife, for a discussion of how forest fragmentation effects wildlife species.

There is little data to base assessment of the value of corridors or stepping-stone blocks on habitat connectivity. Corridors can be useful in some situations and detrimental in others (Simberloff and Cox 1987). Corridors composed of stepping-stone blocks (Alternative B) or corridors broken up by private lands (Alternatives B and C) would result in corridors of relatively poor quality compared to continuous habitat. Mixed ownership tends to increase fragmentation. Modeling has demonstrated that any connection between two isolated patches is better than no connection at all. However, providing additional low quality corridors where better avenues of connectivity exist would tend to have a negative effect on wildlife populations (Henein and Merrian 1990). The stepping-stone seral diversity blocks under Alternative B could have a negative effect compared to not having the blocks to that duplicated higher quality connectivity existing on national forestland (all corridors except the east-west corridors through Glendale and the north-south link through Ashland resource areas). Connectivity corridors proposed for Alternative C would contain old growth habitat embedded in a Matrix of similar habitat and would be of higher quality than Alternative B. Interruption of these corridors by recently harvested private tracts could result in Alternative C corridors being of lower quality than habitat across solid federal ownership.

The general connectivity provided by the 50-11-40 rule under Alternative D is thought to be adequate for a few species, such as the northern spotted owl, but would be composed of habitat which was generally not similar to the old growth and mature forests and would generally be of poor quality for many old growth associated species.

Connectivity within BLM-administered land in the southern GFMA of the PRMP is nearly continuous and would be of relatively high quality. Connectivity in the southern GFMA would be greater than that provided by Alternative D and by the other alternatives. Connectivity within the northern GFMA provided by connectivity/diversity blocks and riparian and other reserves would be of high quality and would not duplicate a better quality link. Alternative E would develop high levels of connectivity over time because of low levels of timber harvest.

Another indicator of habitat fragmentation is the distance between blocks of old growth habitat (200 years plus). Alternatives C, D, E, and the PRMP result in relatively little change from the present condition. Alternatives NA, A, and B would produce appreciable change, with the distances between blocks of old growth habitat increasing.

If the climate of the planning area changes substantially over the long term, the loss of connectivity due to fragmentation in Alternatives NA and A could create a barrier to migration needed by some species to adapt to changes in the ecosystem. The consequences of this situation occurring are not quantifiable.

Effects on Species Richness and Abundance

The alternatives would pose a varying amount of risk to loss of species richness (animals) but would have higher effects on species abundance (plants and animals) (see Vegetation, Wildlife, and Special Status Species Habitat sections). The potential for loss of wildlife species is primarily associated with reductions in older forest seral stages and habitat fragmentation. Effects on species abundance are associated with changes in seral stage frequency and changes in species composition associated with silvicultural systems and habitat protection.

Models of vertebrate species response to forest fragmentation indicate that species diversity begins to decline when 50 to 75 percent of the landscape is harvested within a period of time that does not allow for the return of late-successional forest characteristics (Lehmkuhl et al. 1991). These conditions would be most likely to occur under Alternatives NA, A and B, but could also occur during the next four decades under the northern regime of the PRMP. Over time, conditions under the PRMP would recover. Provision within the PRMP for retention of old growth blocks in watersheds, where little exists, would lessen the impacts of timber harvest.

Vegetation management practices, including site preparation, maintenance, precommercial thinning, and release would have the greatest effect on species abundance because they are designed to influence the relative abundance and dominance of plant species (see Effects on Vegetation). Projected species composition by alternative is shown in Appendix Z. With the exception of pine plantations, shifts in tree species mixes are fairly minor between silvicultural regimes. The principal change is a reduction in hardwood composition and an increase in percent composition by the principal commercial species in each SYU (Douglas-fir or white fir).

Ecosystem Diversity

All alternatives have the potential to change species composition, structural characteristics, and seral stages of the plant communities. However, no alternative would change the potential plant community of a site nor result in a shift in the physical location of plant communities.

An important aspect of ecosystem diversity is the variety of special habitats (talus slopes, ponds, bogs, meadows) that exist on BLM-administered land in the planning area. That diversity would be most protected under Alternatives C, D, E, and PRMP; and least protected under Alternatives NA, A, and B where small pockets of these special habitats would be vulnerable to incidental disturbance from adjacent activities or from effects of the silvicultural system (see Vegetation and Wildlife).

The 47,828 acres of hardwood stands (other than white oak woodlands) on BLM-administered land provide another important element of ecosystem diversity. This acreage would remain in hardwoods under all alternatives other than Alternatives A and B, where such stands would be subject to stand conversion to commercial conifer production. The reduction in hardwood stands through stand conversion is discussed in the timber section.

Conclusion

The effects of the alternatives on the biological diversity of ecosystems would occur at a variety of scales and have different influences if analyzed at the stand level, between stands, or across the planning area.

Alternatives NA, A, B, D, and E would result in increased diversity between stands because habitat conditions would be very different between even-aged managed stands and natural stands. These alternatives would result in significantly lower within-stand diversity and would reduce seral diversity at the planning area level. They pose a higher level of risk for the survival of species within functional ecosystems than do the other alternatives.

The effects of Alternative E on biological diversity are difficult to evaluate because it is uncertain what might happen to large reserves created out of a previously managed landscape. In the short term, biological diversity present under Alternative E would change little from the present. In the long term, a forest managed under this alternative would contain some mixture of older forest islands and early seral islands created through catastrophic stand replacement. Despite the provision for the use of prescribed fire in Alternative E, the alternative is largely based on resource protection. Current stand conditions, roads, land uses, and landscape patterns make it unlikely that such a protection strategy would be successful in the long term maintenance of biological diversity (Brussard 1991). Long term risks associated with reliance on Alternative E are likely to be higher than for Alternatives C and the PRMP.

Allocations under Alternative C would maintain diversity within stands and between stands. Over time, diversity would improve considerably over current conditions. Natural characteristics of seral stages would be produced. Ecological processes would be maintained.

The PRMP poses somewhat higher risks to biological diversity than does Alternative C, particularly in the northern GFMA. The extent of this risk cannot be readily quantified, but results from lower rates of structural retention and a higher reliance on intensive management techniques. The PRMP southern GFMA is similar to Alternative C in formulation, but has a shorter rotation. In the short term, the PRMP poses a higher risk to retention of biological diversity than does Alternative E because of a higher rate of harvest in the next decade in an already fragmented landscape, but provides a better chance of attaining seral and structural balance over time than does Alternative E. Alternatives NA, A, B, and D would pose considerably more risk to long term retention of species within a managed forest environment than PRMP because of their impact on seral balance, habitat fragmentation, and ecosystem processes.

The short and long term effects of the alternatives on specific aspects of biological diversity is summarized in Table 4-BD-9. Change toward the conditions which existed naturally is considered positive; change away from those conditions is considered negative.

In the short term under all alternatives, most of the habitat that maintain biological diversity would decline except for Alternative E and the PRMP which would show little change. An increase in early seral stages would occur under all alternatives, except Alternative E and the PRMP, where a reduction in early seral vegetation would occur. Alternative C and the PRMP, which incorporate natural ecological processes more fully than other alternatives would tend to maintain the current condition.

Under Alternative C and the PRMP in the long term, conditions would change toward conditions estimated to have existed historically. Alternatives NA, A, and B would result in the greatest change away from natural conditions. In the long term for all alternatives, a balance of seral stages would be created which would meet the known dispersal requirements of wildlife species. However, under Alternatives NA, A, and B, the habitat that would exist in young regrowing

Table 4-BD-9. Changes in Components of Biological Diversity by Alternative

Aspect of Biological Diversity	NA	A	B	C	D	E	PRMP
(Short Term-10 years)							
Old forest	-	-	-	-	-	+	+
Early-mid seral acres	-	-	-	-	-	+	+
Seral stage balance	-	-	-	-	-	+	-
Special habitats (talus, meadows)	-	-	-	0	0	0	0
Hardwoods stands (amount)	0	-	-	0	0	0	0
Riparian zones	0	0	0	+	+	+	+
Special areas	0	-	-	+	+	+	+
Snags/Wildlife trees	-	-	-	0	+	+	+
Dead and down material	-	-	-	0	-	-	0
Landscape connectivity (dispersal)	-	-	-	-	0	-	-/0[1]
Landscape connectivity (Similarity)	-	-	-	-	-	-	-
Species composition	-	-	-	0	-	-	-/0[1]
Ecosystem process/Stability	-	-	-	0	0	0	-/0
(Long Term-100 years)							
Old growth acres	-	-	-	+	+	+	+
Early-mid seral acres	-	-	-	+	+	+	+
Seral stage balance	-	-	-	+	+	-	+
Special habitats (talus, meadows)	-	-	-	0	0	0	0
Hardwoods stands	0	-	-	0	0	0	0
Riparian zones	-	-	-	+	+	+	+
Special areas	0	-	-	+	+	+	+
Snags/Wildlife trees	-	-	-	+	+	+	+
Dead and down material	-	-	-	+	+	+	+
Landscape connectivity (dispersal)	+	+	+	+	+	+	+
Landscape connectivity (similarity)	-	-	-	+	+	+	+
Species composition	-	-	-	+	0	0	+
Ecosystem process/Stability	-	-	-	+	+	+	+

[1] A split in the ranking indicates a difference in the expected effects for the northern and southern GFMAs of the Preferred Alternative.
+: Change toward conditions that existed naturally.
0: Maintaining.
-: Change away from conditions that existed naturally.

forests would be structurally and functionally dissimilar to the original habitat. Total landscape connectivity, considering seral stage landscape arrangements and the similarity of intervening managed areas to natural habitat, would be greatest under Alternatives C and the PRMP.

Alternative C and the PRMP could result in increased ecosystem stability due to the greater seral diversity, stand structure, and function process maintained as compared to the other alternatives.

Effects of the Alternatives on Forest Health

Forest health in the broadest sense includes all the elements of the forest ecosystem that influence the forest's relative ability to remain productive, resilient, and dynamically stable over time and to withstand the effects of periodic natural and man-caused stresses. Maintenance of forest health (stand condition) is key to the achievement of management objectives. This section describes the effects of the alternatives on forest health in terms of tree mortality, changes in growth and vigor, and changes in species diversity.

Effects of Land Use Allocations

Allocations within each alternative impact forest health through variation in proposed management practices, silvicultural systems used, and size. Stands within allocations that incorporate, maintain, or emphasize ecological processes (function) show the greatest potential for long term maintenance or improvement of vigor, reduction of tree mortality, and retention of desired species (see also Biological Diversity). With the exception of allocations that contain specific provisions for treatments to improve stand condition (such as riparian management areas, riparian reserves, and areas dedicated to older forest), short term differences between the alternatives are minimal.

Allocations to Riparian Management Areas/Riparian Reserves

Management activities within riparian allocations in all alternatives would be designed to maintain or improve riparian conditions that support water-related functions (processes). With limited exceptions, only management activities for stream/riparian enhancement or the enhancement of fish and wildlife habitat would be permitted. Under the PRMP, management activities within Riparian Reserves would be required to contribute to the attainment of the Aquatic Conservation Strategy. Because of their emphasis on maintenance of ecosystem functions, riparian areas throughout the landscape will contribute to the maintenance of processes within upland stands. The PRMP contains the most acres allocated to riparian areas, 43 percent of district lands. Other alternatives provide considerably less acreage with less than 7 percent of the district in riparian allocations for Alternatives NA, A, B, and C. Alternatives D and E have 13 and 18 percent, respectively, in riparian areas.

Allocations to Older Forests

Similar to riparian areas, areas of older forest distributed across the landscape will help to maintain ecosystem functions and thereby contribute to the health of adjacent and nearby stands. All alternatives except the NA and A contain specific features such as old growth corridors, Restoration and Retention Blocks, and Late-Successional Reserves that are designed to develop and maintain older forest conditions across the landscape. While Alternatives NA and A do not contain features that distribute older forest across the landscape, some existing older forest would be retained and areas would develop characteristics of older forest. Alternative E retains the largest amounts of older forest and over time develops the greatest number of acres with characteristics of older forest. Alternatives C, D, and the PRMP retain less and develop slightly less older forest than Alternative E. Alternatives NA, A, and B retain and develop the least.

Allocations to Timber Production

Alternatives that have unconstrained minimum harvest ages (short rotations) and no provisions for the maintenance of ecosystem functions would have the greatest risk of decreased forest health in the long term. Long term effects could include reduced soil nutrient reserves, an increase in root diseases, and reduced diversity within stands. Risk of long term forest health decline would be greatest in Alternatives NA, A, and B. Forest health risks on lands allocated to timber production would be similar for Alternative E, however, since this alternative has relatively few acres allocated to timber production, total risk would be less. Alternatives with large allocations to timber production would have the greatest opportunities for improvements in stand condition.

Effect of Silvicultural Practices

Practices that Reduce Stand Density or Competition

Practices such as precommercial thinning/release, commercial thinning, and maintenance treatments that reduce competition within a stand have the potential to improve stand health regardless of treatment objective. With some treatments, specifically thinning of larger diameter trees, increased vigor and growth can last for several decades (Williamson 1982; Williamson and Price 1971). In addition to increased vigor, there is an increased ability to withstand insects and disease. Filip et al. (1990) reported that resistance of true fir to Armillaria root disease could be increased by improving tree vigor through precommercial thinning. Williamson (1971) reported a 61 percent reduction in loss caused by bark beetles in thinned Douglas-fir stands ranging from 70-150 years of age. In a study conducted during an outbreak of the western spruce budworm, thinned and nitrogen fertilized stands of grand fir were found to have increase growth efficiency, reduced mortality, and reduced fire hazard through a period of up to five years (Waring et al. 1992).

Projected levels of practices such as commercial thinning, precommercial thinning, and release with provisions to maintain forest health could allow a similar amount of thinning/release to reduce stand density or competition to occur in all alternatives. To meet management objectives however, higher levels are projected in Alternatives NA, A, B, C, and the PRMP.

Fertilization

In the Pacific northwest, nitrogen is commonly regarded as the nutrient most often limiting the growth of forests, although sulfur in conjunction with nitrogen, may be a limiting nutrient in some forests of southwestern Oregon (Edmonds and Hsiang 1987; Waring et al. 1992). For at least the conifer species, current theory holds that soil nutrient deficiency leads to an increase in the proportion of energy allocated to the growth of small roots and a corresponding reduction in energy allocated to foliage and stem growth. If the situation is chronic, tree vigor (expressed as wood growth per unit of foliage) may remain below normal leading to increased susceptibility to attack by insects and disease (Waring 1987).

Low tree vigor resulting from nutrient deficiency may increase susceptibility to disease in a stand. A correlation between low levels of certain soil nutrients and the presence of infection (Singh 1983) and decay (Shields et al. 1979) have been found. In addition to improving vigor, researchers have found that fertilizing with urea increased antagonistic fungi that naturally compete with root disease pathogens (Nelson 1975) and therefore, may increase tree survival on sites effected by laminated root rot (Matson et al. 1984).

Fertilization has been shown to reduce thinning shock and to stimulate the growth of new foliage when timed with thinning or release practices.

Projected levels of fertilization with provisions to maintain forest health could allow a similar amount of fertilization to occur in all alternatives. To meet management objectives however, higher levels are projected in Alternatives NA, A, B, C, and the PRMP.

Prescribed Fire

Proper use of prescribed fire, specifically underburning, would improve stand vigor by reducing competition for nutrients, water, and light. Over a longer period of time, underburning would contribute to healthy forest stands through the creation of structural diversity and the maintenance or restoration of fire related processes. Additionally, underburning has been found to reduce dwarf mistletoe occurrence in the lower crowns of ponderosa pine (Filip 1990). Underburning could also be used to lessen the risk of stand replacement fire. Alternatives C, D, and the PRMP are projected to have the highest levels of underburning.

Prescribed fire for the purpose of site preparation prior to planting or for seedbed preparation would be greatest in Alternatives NA, A, and B. Reduction of hardwood and shrub competition through moderate burning under all alternatives would lead to increased conifer vigor. However, intense burning would lead to decreased vigor in the long term due to the loss of soil productivity.

Plant Community Restoration

Plant community restoration treatments would be designed to establish and maintain desired species within forest ecosystems. Conditions would be created that would reduce the need for treatments to maintain a stand in a desired functioning condition. An example of this would be the establishment of grass in the understories of stands of the pine series in areas that have been previously dominated by a mixture of Douglas-fir, true fir, and hardwoods. Removal of woody plants and the establishment of grass would reduce moisture stress on the desired overstory ponderosa pine and Douglas-fir by reducing competition during droughty periods. Stand vigor and resiliency to disturbance would increase. Ultimately, overstory mortality would be reduced and the risk of stand replacement fire would lessen. Periodic burning or other treatment to maintain the grass may be required but should require less effort and expense than removal of resprouting hardwoods, shrubs, and naturally-seeded fir.

Plant community restoration treatments could also be done in areas where management objectives could not be met because of disease or insect occurrence above endemic levels. Treatments would involve modifying stand composition to favor less susceptible species. In the case of epidemic disease, nonsusceptible species may need to be on the site for extended periods of time before desired species can be returned.

The PRMP contains the only estimate of acres to be treated.

Conclusion

Comparison of allocations by size and practices by acres proposed for treatment only gives an indication of what can be accomplished "forest health-wise" within an alternative. Stand vigor and resiliency can be improved, mortality of desired stand components can be reduced, and species appropriate for the site can be maintained through a variety of avenues. Consequently, comparison of the alternatives can only be accomplished by viewing each alternative in its entirety.

In the short term, forest health effects would be expected to be similar for all alternatives. Stands within the alternatives would be in a condition where management objectives could be met.

While practices in all alternatives would be designed to retain long term site productivity, to promote ecosystem health, and to assure the sustainability of timber production, less certainty exists on long term forest health effects of Alternatives NA, A, and to some degree B that use shorter rotations without specific provisions for the maintenance of ecological processes. In the long term and with active management, Alternatives C, D, E, and the PRMP would be expected to have similar effects. The PRMP would be expected to show the greatest improvement in overall forest health and the greatest number of stands in a vigorous condition primarily because of an identified program and a series of treatments designed for increasing stand vigor and resiliency, reducing mortality, and maintaining species appropriate to the site.

Effects on Vegetation

The alternatives would effect the relative abundance and dominance of individual plant species or species groups. While species composition would change for specific areas, none of the alternatives would likely result in the complete removal of any species from a significant portion of the planning area.

Effects on vegetation would be the result of practices and silvicultural systems on individual plants or plant populations. Short term effects on vegetation would arise principally from management of plant communities for timber production, grazing, wildlife habitat enhancement, recreation, minerals extraction, and other purposes. Species in different plant communities would respond differently to management actions. The most important changes in plant communities would arise from effects on the structure of forest stands and upon the kind, intensity, and frequency of disturbance events that reset succession, prepare seedbeds, determine the landscape arrangements of seral stages, and help determine stand structure. Long term effects of the alternatives would be closely tied to the retention of functional ecosystems and the total diversity of the area (see Biological Diversity).

The allocations that would protect areas from natural disturbances, or change disturbance frequency, type, or intensity could also change vegetation in the long term.

Effects on special status species and riparian vegetation are addressed in subsequent sections of this chapter. None of the alternatives would substantially effect aquatic vegetation. The following analyses use the existing vegetative condition as a basis of comparison among the alternatives.

Effects of Upland Vegetation

The most noticeable effect of the alternatives on vegetation would be changes in the relative abundance of seral stages. However, because the alternatives involve the use of different silvicultural systems, they would also differ in their effect on the relative abundance and dominance of species within seral stages.

The abundance and dominance of individual plant species vary among seral stages. Grasses, forbs, shrubs, and shade-intolerant conifers are most common in the early seral stage. Shade tolerant hardwoods and conifers are most common in mature and old growth stages. Few plant species are found in only one seral stage, particularly in the original forests of southwestern Oregon, which has a complex within-stand patchwork of seral vegetation associated with openings in the canopy and frequent disturbance. For the Douglas-fir region as a whole, Spies (1991) reported that most species associated with old growth were not restricted to that seral stage, but could be found with moderate frequency and abundance in at least the next younger age-class. Only Pacific yew and lungworts (*Lobaria sp.*) are known to show strong preference for the old growth seral stage. For a discussion of the effects of the alternatives on the balance between seral stages, refer to the Biological Diversity section.

Silvicultural practices common to all alternatives would effect the dominance and abundance of species in seral stages. Regeneration harvesting methods, site preparation, and vegetation management practices would have the largest direct effect. Probable effects of genetic selection are discussed in the Biological Diversity section.

Under all alternatives, most young stands would contain a representation of commercial conifer species, hardwoods, and other plants native to the site. Although no hardwood retention goal was set for the No Action (NA) Alternative, experience has shown that stands managed under silvicultural systems used in the NA usually retain hardwoods. Design criteria for silvicultural systems under Alternatives A, B, D, E, and the northern general forest management area (GFMA) of the PRMP would result in the retention of a minimum of two native hardwoods per acre where present. Larger numbers of hardwoods in different canopy levels would be retained to meet target stand diversity objectives in Alternative C and the southern GFMA of the PRMP. Stands managed for timber production in all alternatives would have a higher component of conifers and a lower abundance or dominance of hardwoods and other nonconifer vegetation than natural stands.

The effect of silvicultural systems on species composition of stands later in their rotations were analyzed using the ORGANON model and is discussed under the effects of specific alternatives (see Appendix 4-V-1, Draft RMP).

Alternatives NA, A, B, and D are based primarily on management of large areas with even-aged silvicultural methods. Under these alternatives, the BLM-administered forest landscape would continue to be modified toward a patchwork of even-aged stands of various sizes and ages, separated by riparian management areas (RMAs) and nonsuitable woodlands. Portions of the Klamath and Jackson sustained yield units (SYUs) would contain multiple-canopy stands through a portion of each rotation due to the need for frost protection. These stands would have less early seral vegetation and a higher percentage of more tolerant conifers and hardwoods compared to clearcut units. Despite the use of shelterwood retention systems, disease, blowdown, and other stand conditions would result in a limited amount of even-aged management in frost prone areas. These areas would be reforested with pine and would differ in species composition from the original stand. The forest landscape would contain numerous stands with mixtures of young conifers and early seral vegetation and numerous dense even-aged stands under 100 years of age, which would contain fewer plant species than most natural stands. Species that favor older forest types would be present in lower abundance than what currently exists.

Early seral stands in areas managed for timber production in the Douglas-fir/ponderosa pine/ceanothus/herbaceous plant grouping would be dominated by herbaceous vegetation and shrubs such as ceanothus, manzanita, and vine maple. Under Alternatives NA, A, B, and D, environmental conditions such as available light and site disturbance would be favorable for the establishment of these species. Species composition would shift to conifers and shrubs in the mid-seral stage and shift again to a stand of predominantly conifers as canopies closed and other vegetation is shaded. The mixed conifer/interior valley/grass grouping would follow a similar developmental path, but the early seral stage would contain a higher percentage of grass instead of herbaceous vegetation. The Douglas-fir/tanoak-madrone grouping would begin as a mixture of shrubs and hardwoods and shift to conifer dominated stands with a few hardwoods as the stands aged (see Table 3-V-1, Draft RMP).

Under Alternatives NA, A, B, and D, stands managed for timber production would generally contain a higher proportion of Douglas-fir than natural stands, except for sites that were reforested principally with pine.

Under Alternatives B and D, mature and old growth stands retained in seral stage blocks or in habitat conservation areas (HCAs) would provide protection in the short term for a higher level of old growth seral communities. In the short and long term, proposed fire management regimes would aid in the prevention of seral stage shifts, which change species composition and dominance and increase the likelihood of catastrophic stand loss from wildfire or other causes.

The species composition of stands produced under Alternatives NA, A, B, and D would be less like the species composition of natural stands than the other alternatives.

Under Alternative C and the southern GFMA of the PRMP, the forest would be structurally and serally more diverse than in other alternatives, and the species present in each seral stage would more closely resemble those in natural forests. While harvest units would contain species groups from all seral stages, the units would not contain the large amounts of herbaceous and early seral shrubs characteristic of even-aged units. Early seral vegetation would be present in patch harvest units.

Each of the three major plant groupings would respond somewhat differently to timber management. The Douglas-fir/ponderosa pine/ceanothus/

herbaceous grouping is largely composed of forests of the white fir series. Within this series, Alternative C and the southern GFMA of the PRMP would substantially reduce the amount of grass and early seral species invading regeneration harvest units. The species composition of older stands originating under this prescription would resemble that of natural stands on these sites. However, poor stand condition, disease, and blowdown would result in some stands developing from even-aged silvicultural systems. These latter stands would be primarily pine.

The mixed conifer/interior valley/grass grouping is largely composed of forest stands of the Douglas-fir series. These stands would have much less grass, deerbrush, and other early seral nonconifer vegetation than even-aged management would produce. Stands regenerated under Alternative C and the southern GFMA of the PRMP would probably have a higher level of reforestation success with Douglas-fir than what has been experienced. Density management would result in higher levels of pine retention in existing stands than is now experienced and overall increases in stand vigor. Species composition in later seral stages would resemble that of natural stands.

The Douglas-fir/tanoak-madrone grouping is largely composed of forest stands of the tanoak series. These stands would require careful adaptation of Alternative C and the southern GFMA of the PRMP to individual sites to prevent increases in tanoak and decreases in the conifer component of stands. A higher level of well-designed prescribed fire use would be required than currently accomplished. Density management regimes would require coordination of under-canopy prescribed fire (underburning) and other vegetation management treatments to prevent an increase in tanoak abundance. Species composition in later seral stages should resemble that of natural stands, except for the effects of hardwood control.

Under Alternative C, retention and restoration (R&R) blocks would provide protection in the short term for a greater level of old growth seral communities than in Alternatives NA, A, or B. In the short and long term, proposed fire management regimes would aid in preventing seral shifts which change species composition and dominance and which otherwise increase the likelihood of catastrophic stand loss from wildfire or other causes.

Lands managed for timber production under Alternative E would have species composition and developmental paths similar to Alternative A. However, this alternative contains large amounts of land not managed for timber production which would provide for the short term protection of existing plant communities. In the long term, these communities would develop toward later seral stages with species presence and abundance changing. In the short and long term, proposed fire management regimes would aid in prevention of seral shifts in older stands that change species composition and dominance and which otherwise increase the likelihood of complete stand replacement from wildfire or other causes such as windstorms or insect attack. However, the proposed prescribed fire regime would still leave large areas untreated. Catastrophic replacement of large sections of the landscape would become more likely and would result in large areas of brushfields or other early seral vegetation (Gratkowski 1961).

The PRMP would employ two general silvicultural systems and variations of those systems designed to mitigate frost and soil problems in the northern GFMA. Species composition and developmental path of stands managed under the northern GFMA would resemble that of Alternative A systems.

Under the PRMP, management of existing mature and old growth stands within reserves, in watersheds where little currently exists, and within connectivity/diversity blocks would retain mature and old growth seral communities in the short term. In both the short and long term, proposed fire management would aid in preventing seral shifts which change species composition and dominance and would otherwise increase the likelihood of catastrophic stand loss from wildfire and other causes. Habitat manipulation, forest health restoration treatments, and timber management would provide additional tools and options that would increase the likelihood of success. Brussard (1991) noted however, "the solid underlying science necessary for developing appropriate conceptual models for biological diversity management is generally lacking." Careful, adaptive modeling and experimentation would be required for successful implementation.

Under the PRMP, all silvicultural prescriptions would result in development of stands that contain all existing tree species. The southern GFMA would result in stands that most closely resemble the current species abundance and dominance found in older natural stands. Pacific yew and lungworts would be retained in riparian areas and, to a limited extent, on upland sites.

Mortality salvage under all alternatives would have no direct effect on the species composition of stands; however, in the long term, stands subject to repeated mortality salvage without regeneration harvests would generally experience a seral shift toward more shade tolerant species (such as tanoak) and would sometimes shift stands toward less stable and less productive species mixtures (Douglas-fir or white fir on pine sites).

Effects of Riparian Vegetation

Riparian vegetation along intermittent second order streams, along first order streams, and in small seeps or wet areas, which are difficult to protect during logging or silvicultural operations, could be adversely effected by timber management operations. Changes in species composition and seral stage could result (see Riparian Zones).

Larger, downstream riparian areas, which are protected by riparian management areas (RMAs), would sometimes have unavoidable adverse effects from timber management operations. In the short term, protection of such areas from timber harvest would retain natural species diversity and structure. Riparian zones on larger streams have a lower natural disturbance frequency than upslope sites and would generally not show strong seral shifts under protective management. However, riparian areas on smaller headwater streams have seral patterns and disturbance regimes similar to adjacent upland areas. Protection of riparian areas on these streams under Alternatives D, E, and the PRMP would result in short term maintenance of species composition, but may result over the long term in shifts toward later seral vegetation including tanoak.

Effects of Permanent Forage Areas and Wildlife Seedings

These actions would change species composition, species abundance, and the seral developmental pattern of effected sites and plant communities. In addition to effecting higher plants, seeding with either grasses or ceanothus species on forest sites effects soil biota including mycorrhizal fungi populations. These changes would be localized and total acres treated would be minimal under all alternatives.

Effects of Recreational Development and Use

Outdoor recreation has minor effects on vegetation through campsite use, trampling, and cutting of vegetation for fuel; through the accidental or intentional importation of exotic plants and animals; and through interference with natural processes. Effects would be similar for all alternatives.

Effects of Special Forest Products

Harvest of special forest products has the potential to change species composition and distribution in localized areas. Effects would be similar for all alternatives. No large scale effects are expected. See Special Forest Products.

Effects of Livestock Grazing

These effects are described in the Medford Grazing Management Final EIS.

Effects of Mining and Mineral Development

Mining and mineral development have a direct and lasting effect on vegetation; however, the scale of mining in the planning area is small and no large scale effects are expected.

Effects of Special Habitats

Some smaller vegetative communities that occur within special habitats (serpentine barrens, bogs, meadows, rock cliffs, and talus slopes) would be protected from direct effects and somewhat protected from external influences by buffers or by the features of silvicultural system under Alternatives C, D, E, and the PRMP (see Chapter 2, Wildlife). Under Alternatives NA, A, and B, no buffers would be provided. The vegetation communities of small special habitats would be particularly vulnerable to incidental disturbance from activities on adjacent lands.

Effects of the Introduction of Insects, Plant Diseases, and Exotic Plants

Under all alternatives, human activities including timber harvest, road construction, and silvicultural treatments have the potential to influence vegetation through introducing or spreading insects, diseases, and exotic plants. Port-Orford cedar root disease has been introduced through most of the range of the species.

Further spread of introduced grasses and other weeds would occur. Silvicultural regimes that retain higher canopy closure levels could limit the spread of shade intolerant species.

Although increased road access would provide additional opportunities for the spread of noxious weeds, implementation of weed control measures described in the Northwest Area Noxious Weed Control Program, Record of Decision (Appendix 1-C, Draft RMP) would provide an effective mechanism for their control.

Effects of Land Use Authorizations

Under all alternatives, the Medford District would continue to issue right-of-way grants to cover water pipelines, utility lines, and access, both on existing roads and utilizing new construction areas. Leases and permits would be issued to authorize agricultural, residential, and commercial use.

It is estimated that approximately 50 such actions per year could be authorized. The effects of such actions on natural resources would be negligible because most would use existing disturbed areas. All effects would be assessed in site-specific environmental assessments.

Effects of Land Exchanges

Under all alternatives, efforts would be made to negotiate land exchanges to permit better and more efficient management of BLM-administered land. The effect of land exchanges on plant communities would be assessed in site-specific environmental assessments (EAs). Lands exchanged or sold out of government ownership are expected to be converted to produce the highest economic return to the landowner. These uses include timber production, improved pasture, rural homesite, and recreational development. However, overall adverse effects under all alternatives are anticipated to be small.

Effects of Microclimate

Timber harvest regimes would effect microclimates within harvest units that would in turn exert an influence on the development of plant communities. These changes include within-unit wind speed near the ground, within-stand heat radiation, local air circulation, and heat movement from the soil.

The effect of timber harvest on microclimates outside of harvest units such as increases in the risk of frost damage to vineyards or agricultural crops are slight. Air circulation is unique to local topography, however, some generalizations can be made. On clear nights, cold air drainage is most developed over regular surfaces (such as unharvested timber stands or uniform clearcuts) on gentle slopes but flows readily down steeper slopes regardless of surface regularity. Nighttime cooling of air is moderated by upward flow of heat from the ground and is greatest in clearcut units. Nighttime cooling is also moderated by mixing between air layers. Mixing is greatest where air flow is greatest due to the greater turbulence in rapidly moving air. Partial cut harvesting, which increases air turbulence, would have a slight positive effect on off-site temperatures, however, the increase would be too small to be detected. Other forms of harvesting would have little or no off-site effect.

Conclusion

Silvicultural systems and allocations are sufficiently different between the alternatives to cause differences in the relative abundance and dominance of plant species. While the species composition would change for specific areas because of management actions, no species would be removed from a large portion of its habitat under any alternative.

Alternatives NA, A, B, and D would cause increases in the amount of vegetation found in early and mid-seral stages. Alternative C would result in species abundance and dominance that more closely resembles natural conditions than would Alternatives NA, A, B, and D. Alternative E would result in the short term protection and/or increase in species most common to older forest types and pose a risk for loss of large older forest areas to early seral vegetation following fires and insect attack.

The PRMP would result in species abundance and dominance similar to Alternative C for the southern GFMA. In the northern GFMA, vegetation would be similar to Alternatives NA, A, B, and D. Late-successional reserves (LSRs), riparian reserves (RRs), research natural areas (RNAs), areas of critical environmental concern (ACECs) would provide an adequately large area in which natural vegetation communities could be preserved in the near term for scientific study and as genetic reserves and reserves of species composition and ecological processes.

Effects on Riparian Zones

Healthy riparian zones benefit water quality, fish, wildlife, and plant habitat. Topics covered in this section are riparian vegetation, coarse woody debris, floodplains and hyporheic zones, and edge effects. Discussions of water quality, fish, wildlife, and plants are in the Water Resources, Fish, Wildlife, and Vegetation sections, Chapter 4.

Management activities that could adversely effect riparian zones both locally and on a watershed scale include timber harvest, site preparation, and road construction. Other management actions that could have localized adverse effects on riparian zones include mining, grazing, herbicide application, and facility and trail construction. Effects of grazing on riparian zones are discussed in the Grazing EIS (USDI, BLM, MDO 1984), and effects of herbicide application on riparian zones are in *Western Oregon Program-Management of Competing Vegetation EIS (USDI, BLM, OSO 1989).* It is anticipated there would be little or no salvage harvest within riparian management areas (RMAs) or Riparian Reserves and few, if any, adverse effects are anticipated.

Suppression of high intensity wildfires from riparian zones would maintain riparian conditions as long as the suppression (firelines, etc.) would not cause more damage than a wildfire. In the long term, continued fire suppression could allow fuels to accumulate to the point where the potential for catastrophic fire could become very great.

The analyses and conclusions regarding riparian areas in the FSEIS have been incorporated in the PRMP impact analysis (FSEIS page 3&4-66). The FSEIS Alternative 9 Riparian Reserves were adopted in the SEIS ROD, which in turn has been incorporated into the PRMP.

Comparison of Effects by Alternative

Best management practices (BMPs) under all alternatives are designed to mitigate adverse effects while meeting other resource management objectives. Riparian Reserves under the PRMP are designed to meet Aquatic Conservation Strategy objectives for different waterbodies. The widths are intended to provide a high level of fish habitat and riparian protection until watershed and site analysis can be completed (SEIS ROD page B-13). RMAs for Alternatives A-E are designed to protect, maintain, or improve proper functioning condition of riparian zones (as defined by BLM's Riparian-Wetland Initiative for the 1990s). The extent to which Alternatives A-E protect, maintain, or improve proper functioning condition of riparian zones vary depending on RMA width (see Table 2-1). RMA widths for Alternatives B-E vary by stream order and provide greater protection to the larger order streams. Larger streams generally have wider riparian zones, floodplains and hyporheic zones, and usually support fish. Under Alternatives A-E, first and second order fish-bearing or perennial streams are treated the same as third order streams. For the NA Alternative, RMA widths apply only to fish streams and are 50 feet for resident fish streams in the Josephine SYU and 100 feet for all other fish streams in the planning area.

Riparian Vegetation

Vegetation in riparian areas regulates the exchange of nutrients and material from upland forests to streams (FSEIS page 3&4-59). Riparian vegetation strengthens streambanks, contributes woody debris, and governs the influx of light and organic matter to the stream (Meehan 1991). Potential adverse effects of management activities on riparian vegetation include partial or total loss of riparian vegetation and a change in vegetative structure, species diversity, and composition from coniferous to deciduous. Effects on riparian wildlife habitat are discussed in Chapter 4, Wildlife.

Timber harvesting is the management activity with the greatest potential for removing riparian vegetation. Under the NA Alternative, all or a portion of the riparian vegetation would be subject to timber harvest along nonfishery streams, streams supporting resident but not anadromous fish in the Josephine SYU, and fifth order and larger streams. This would result in a short term loss of riparian vegetation and a long term change in species diversity, structure, and composition of riparian vegetation on approximately 111,000 acres.

First and Second Order Streams. For analysis purposes, it is assumed riparian zones along first and second order perennial streams are 75-feet wide on either side and would be protected under all alternatives except the NA Alternative. Riparian zones along first and second order intermittent streams are assumed to be 50-feet wide on either side. Discussion of first and second order intermittent streams only refers to nonfish-bearing streams. First and second order perennial or fish-bearing streams are included in the analysis of third order streams.

Riparian vegetation would be subject to timber management (harvest and prescribed fire) along first and second order intermittent streams for Alternatives NA-C and along first order intermittent streams for Alternative D. Brush, hardwoods, Pacific yew, and nonmerchantable and noncommercial conifers would be reserved from harvest within 25 feet of these streams. However, it is likely the riparian vegetation along a large percentage of these first and second order streams would be lost due to timber management. The high and low structural retention silvicultural systems for Alternative C would retain some riparian vegetation along first and second order intermittent streams and would provide more protection than Alternatives NA, A, and B along these streams. Alternative C would provide more protection to the riparian vegetation along first order intermittent streams than Alternative D. The RMA along second order intermittent streams under Alternative D would include the riparian zone, although it could be subject to inadvertent damage from adjacent timber management activities.

The RMAs for Alternative E and the Riparian Reserves for the PRMP would retain riparian vegetation adjacent to first and second order intermittent streams. Under Alternative E, the RMAs are equal (first order) or slightly wider (second order) than the width of the riparian zone. Riparian vegetation along these streams could be subject to inadvertent damage from logging and prescribed fire in adjacent units. The Riparian Reserves for the PRMP would offer the greatest protection of riparian vegetation along first and second order intermittent streams because they would buffer the riparian vegetation from physical disturbance caused by adjacent management activities. Although the Alternative E RMAs along first and second order intermittent streams are narrower than the PRMP Riparian Reserves along these streams, overall, Alternative E may provide greater protection because of the large area that is not available for timber harvest.

The approximate miles of first and second order intermittent streams subject to timber harvest and prescribed fire in the long term is shown by alternative in Table 4-RZ-1. Loss of riparian vegetation on first and second order streams would be greatest for Alternatives NA, A, and B; less for Alternatives C and D; and least for Alternative E and the PRMP.

Third Order and Larger Streams. RMA widths prescribed for Alternative B are assumed to match actual riparian zone widths on most third order and larger streams. The Alternative A riparian management area for third order streams would be equal to the riparian zone width and no riparian vegetation would be removed. Under Alternative A, riparian vegetation removal would occur along fourth order and larger streams where the riparian zone is generally wider than the 75-foot RMAs allocated to these streams. Under this alternative, approximately 7,800 acres of riparian vegetation would be removed by timber harvest over the long term.

RMAs for Alternative B would be equal to the width of the riparian zone for third order and larger streams. Riparian vegetation would not be removed, however, these riparian zones could be subject to inadvertent damage from logging and prescribed fire in adjacent units.

RMAs for Alternatives C, D, and E, and Riparian Reserves for the PRMP would be wider than the riparian zone for third order and larger streams. Riparian vegetation would not be removed, and these wider RMAs and Riparian Reserves would buffer the riparian vegetation from physical disturbance caused by adjacent management activities such as timber

Table 4-RZ-1. Approximate Miles of First and Second Order Intermittent Streams on Lands Available for Timber Management

Stream Order	NA	A	B	C	D	E	PRMP
1	2,350	2,970	2,700	1,970	1,820	0	1,990
2	1,240	1,490	1,350	990	0	0	1,000

harvest and prescribed fires. Adverse effects on the riparian vegetation for Alternatives C, D, E, and the PRMP would be much less than the other alternatives.

Lakes, ponds, and wetlands. Riparian vegetation adjacent to lakes and ponds would be subject to timber harvest under the NA Alternative. For Alternatives A-E, the protection for lake and pond riparian zones would be lowest under Alternative A and greatest under Alternative E, with Alternatives B, C, and D falling in the middle. Riparian protection under the PRMP would be either more or less than that of Alternative E depending on the height of a site-potential tree. No RMA is specified for wetlands under Alternatives NA-E, however, wetland protection under Alternatives A-E includes buffering, not entering, or other measures as needed based on site-specific conditions. The Riparian Reserves for the PRMP would provide the greatest protection of wetland riparian vegetation.

Road and log-yarding corridors through riparian zones and mining operations in riparian zones would have the greatest adverse effect on riparian vegetation within RMAs. Adverse effects on riparian vegetation from roads and yarding corridors would be severe but fairly localized. Under the PRMP, watershed analysis would be required prior to road construction in Riparian Reserves, and no log-yarding corridors would be permitted across Riparian Reserves. Based on the miles of road construction estimated by alternative (see Table 4-I-1), Alternatives A, B, and D would probably have the most road crossings through riparian zones; Alternatives NA and C would have less; and the PRMP and Alternative E would have the fewest number of road crossings through riparian zones.

Yarding corridors would likely remove more vegetation under Alternatives NA, A, and B than under C, D, and E because of more harvest acres and associated increase in number of stream crossings. Adverse consequences due to yarding corridors could be partially mitigated by minimizing number of corridors and corridor widths and leaving downed trees in the riparian zone. The PRMP would provide the greatest connectivity of the aquatic ecosystem by minimizing road construction and prohibiting yarding corridors across riparian zones.

Mineral exploration and development would be conducted in accordance with BMPs, subject to valid existing rights. The anticipated level of mining activities would be the same in all alternatives. Based upon the 10-year mineral scenario (see Appendix X), 60 placer exploration operations and 50 bench placer operations are projected to occur. These are the mining activities most likely to have adverse effects on riparian vegetation.

Bench placer operations typically remove the most trees, understory vegetation, and topsoil near streams prior to beginning processing activity. Consequently, species and structural diversity of riparian vegetation would be lost for many decades. This activity also adversely effects streambank stability. Placer exploration would involve removal of riparian vegetation for construction of roads and test pits. One open pit chemical leaching operation is forecast under the 10-year mineral scenario. If this type of operation occurred in or adjacent to a riparian zone, there could be severe adverse effects to riparian vegetation at the site-specific level due to vegetation removal and toxic effects of cyanide on vegetation.

Riparian Condition. Riparian conditions for the short term (10 years) and long term (200 years) are estimated from predicted tree size and effects of management actions in riparian zones. In the absence of detailed, site-specific information on all riparian zones, tree size is the best available data for approximating riparian condition. Riparian zones with trees over 21 inches in diameter are considered to be in good condition, those with trees 12-21 inches in diameter are considered to be in fair condition, and those with trees 0-11 inches in diameter are assumed to be in poor condition.

Riparian conditions would be effected in the short term only for first and second order intermittent streams. For first order intermittent streams, the trend districtwide for riparian condition in the short term would be downward for Alternatives NA, A, and B. The trend would improve slightly under Alternatives C and D and improve greatly under Alternative E and the PRMP. The same relationship would hold true for second order intermittent streams, except riparian condition in the short term would also improve greatly under Alternative D.

Variation in long term riparian conditions by stream order, land allocation, and alternative are shown in Table 4-RZ-2. Existing condition is shown for "all BLM-administered land" but cannot be calculated for "lands available for timber harvest."

Along fourth order and larger streams, approximately 1,600 riparian zone acres (7 percent) would remain in poor or fair condition as a result of past placer mining and existing streamside road locations.

Table 4-RZ-2. Long Term Riparian Condition (Percent of Riparian Zones)

Stream Order	Riparian Condition	Existing Condition	NA	A	B	C	D	E	PRMP
Land Available for Timber Harvest									
1	Minimal	Unknown	50	48	48	24	24	0	24
	Fair	Unknown	50	48	47	71	71	0	71
	Good	Unknown	0	4	5	5	5	100	5
2	Minimal	Unknown	50	46	46	23	0	0	0
	Fair	Unknown	50	46	46	69	0	0	92
	Good	Unknown	0	8	8	8	100	100	8
3	Minimal	Unknown	47	0	0	0	0	0	0
	Fair	Unknown	47	0	0	0	0	0	0
	Good	Unknown	6	100	100	100	100	100	100
4	Minimal	Unknown	29	4	4	4	4	4	4
	Fair	Unknown	71	96	0	0	0	0	0
	Good	Unknown	0	0	9	96	96	96	96
5	Minimal	Unknown	7	6	6	6	6	6	6
	Fair	Unknown	93	94	3	3	3	3	3
	Good	Unknown	0	0	91	91	91	91	91
6+	Minimal	Unknown	0	12	8	8	8	8	8
	Fair	Unknown	100	88	2	2	2	2	2
	Good	Unknown	0	0	90	90	90	90	90
All BLM-Administered Land									
1	Minimal	18	28	34	31	11	9	0	11
	Fair	33	28	34	31	33	29	0	33
	Good	49	44	32	38	56	62	100	56
2	Minimal	18	27	33	30	10	0	0	0
	Fair	33	27	33	30	32	0	0	42
	Good	48	46	34	40	58	100	100	58
3	Minimal	18	26	0	0	0	0	0	0
	Fair	33	26	0	0	0	0	0	0
	Good	49	49	100	100	100	100	100	100
4	Minimal	20	16	4	4	4	4	4	4
	Fair	29	39	70	0	0	0	0	0
	Good	51	45	26	96	96	96	96	96
5	Minimal	18	4	6	6	6	6	6	6
	Fair	26	51	69	3	3	3	3	3
	Good	56	45	25	91	91	91	91	91
6+	Minimal	12	8	8	8	8	8	8	8
	Fair	17	52	67	2	2	2	2	2
	Good	71	40	25	90	90	90	90	90

For all streams in the planning area, the riparian zone acres in poor condition would increase, an adverse effect, from the existing condition by approximately 35 percent under the NA Alternative, 30 percent under Alternative A, and 18 percent under Alternative B. Acres of riparian zones in poor and fair condition would decrease, a beneficial effect, from the existing condition by 55 percent under Alternative C; 72 percent under Alternative D; and 94 percent under Alternative E and the PRMP.

Acres of riparian zones in good condition would decrease, an adverse effect, from the existing condition by approximately 17 percent under Alternative A and 10 percent under the NA Alternative; and would increase, a beneficial effect, from the existing condition by 16 percent for Alternative B; 39 percent for Alternative C; 64 percent for Alternative D; and 95 percent for Alternative E and the PRMP. Figure 4-RZ-1 (See and of this chapter), summarizes these changes.

Riparian Vegetation Summary. For first and second order intermittent streams, loss of riparian vegetation due to management activities would be greatest under Alternative A; followed in order of decreasing loss by Alternatives B, NA, C, D, E, and the PRMP. For third order streams, loss of riparian vegetation would be greatest for the NA Alternative. Some loss of riparian vegetation along third order streams would occur under Alternatives A and B due to adjacent logging operations. Minimal loss of riparian vegetation is anticipated for third order streams under Alternatives C, D, E, and the PRMP. For fourth order and larger streams, loss of riparian vegetation would be greatest in Alternatives NA and A. Some loss of riparian vegetation along fourth order and larger streams would occur under Alternative B as a result of logging operations adjacent to the riparian zone. Minimal loss of riparian vegetation is anticipated for fourth order and larger streams under Alternatives C, D, E, and the PRMP. Loss of riparian vegetation adjacent to lakes, ponds, and wetlands would vary from the NA Alternative to the PRMP, with the NA having the greatest loss and the PRMP having minimal loss. Overall, the greatest loss of riparian vegetation due to management activities would occur under Alternatives NA and A; followed in order of decreasing loss by Alternatives B, C, D, E, and the PRMP. All riparian areas for rivers, streams, wetlands, lakes, and ponds are included within Riparian Reserves under the PRMP (FSEIS page 3&4-66) and therefore, the smallest loss of riparian vegetation is anticipated under the PRMP.

Short term effects on riparian conditions are only estimated for riparian zones adjacent to first and second order intermittent streams. For first and second order intermittent streams, riparian conditions in the short term would be downward for Alternatives NA, A, and B; improve slightly under Alternative C; and improve greatly under Alternative E and the PRMP. Alternative D would result in a slight improvement for first order riparian zones and improve greatly for second order riparian zones.

Long term riparian conditions would be adversely effected under Alternatives NA and A; beneficially effected under Alternatives C, D, E, and the PRMP; and a combination of both under Alternative B.

Coarse Woody Debris

Coarse woody debris (CWD) is a major component of stream ecosystems, which contributes to channel stability, routes sediment and water through the stream ecosystem, provides habitat and food source for invertebrates and amphibians, and provides habitat for spawning and rearing fish. CWD influences the form and structure of a channel by affecting the profile of a stream, pool formation, and channel pattern and position (FSEIS page 3&4-61). Activities such as gross yarding and prescribed fire could remove or consume CWD from riparian zones. Tree removal including salvage in riparian zones would deplete future sources of CWD to streams. Long term reductions in recruitment of CWD to stream channels would result in decreased channel stability, increased stream gradients and velocities, lower capacity of the channel to control storage and transport of organic material and sediment, decreased complexity of aquatic habitat, and reduced quality of pools and cover for fish, amphibians, and small mammals (see Chapter 4, Wildlife and Fish).

The amount of long term CWD contributed to streams would vary by alternative, stream order, and land allocation as shown in Table 4-RZ-3. The amounts of long term CWD in Table 4-RZ-3 are a percentage of the optimal amount available in an old growth forest.

First and Second Order Streams. CWD estimates for first and second order streams include both perennial and intermittent streams. Seven percent of these stream miles are estimated to be perennial and would be protected with an RMA or Riparian Reserve under all alternatives, except the NA Alternative. The potential for CWD recruitment would be much higher in first and second order perennial streams than in first and second order intermittent streams for all alternatives except the NA Alternative. Under the NA Alternative, CWD input for first and second order perennial streams would be the same as the first and

Table 4-RZ-3. Percent of Optimal Long Term Input of Coarse Woody Debris (In Percent) (Based on McDade et al. 1990)

Stream Order	NA	A	B	C	D	E	PRMP
Land Available for Timber Harvest							
1	10	13	13	42	13	71	32
2	10	17	17	45	73	73	43
3	15	78	78	91	95	100	91
4	39	78	88	98	100	100	98
5	69	78	95	100	100	100	100
6+	88	78	100	100	100	100	100
All	15	27	29	53	45	77	47
All BLM-Administered Land							
1	49	35	37	71	60	97	66
2	49	38	43	73	89	98	71
3	54	84	86	96	98	100	96
4	66	84	92	99	100	100	100
5	83	84	97	100	100	100	100
6+	93	84	10	100	100	100	100
All	52	46	48	77	76	98	74

second order intermittent streams unless they contain fish.

Long term recruitment of CWD would be greatly diminished in first and second order intermittent streams under Alternatives NA, A, and B; and in first order intermittent streams under Alternative D. Adverse effects on these streams would include decreased channel stability, increased stream gradients, velocities, and channel erosion, reduced sediment trapping capability, and increased movement of sediment downstream.

Under Alternative C, the structural retention silvicultural system would retain more large conifers along first order intermittent streams than Alternatives NA, A, B, and D. Long term recruitment of CWD to second order intermittent streams would be greater under Alternative C than Alternatives NA, A, and B.

Under Alternative E, the RMA along first order intermittent streams would provide a greater amount of CWD than all alternatives, except the PRMP. Under Alternatives D and E, RMAs along second order intermittent streams would contribute approximately 73 percent of the optimal amount of long term CWD, which is much higher than Alternatives NA-C.

The PRMP would provide 100 percent of the optimal amount of long term CWD to first and second order intermittent streams, which is substantially greater than the other alternatives.

Third Order and Larger Streams. Under Alternatives C, D, E, and the PRMP, RMAs and Riparian Reserves for third order and larger streams adjacent to lands subject to timber harvest would provide a greater amount of long term CWD than Alternatives NA, A, and B. The PRMP would provide the greatest amount and the NA Alternative would provide the least amount.

Coarse Woody Debris Summary. On lands available to timber management, contribution of CWD to all streams would be smallest for the NA Alternative; followed in order of increasing contribution by Alternatives A, B, D, C, E, and the PRMP. For the entire planning area, contribution of CWD to all streams would be smallest for Alternatives A and B; larger for the NA; substantially larger for Alternatives C and D; and largest for

Alternative E and the PRMP. While the relationship between alternatives is similar for all BLM-administered lands and lands available for timber management, the overall contribution of CWD is much higher from timbered lands that are not available for timber management.

Based on long term input of CWD, the probability of maintaining stream function and structure in all streams adjacent to lands available for timber management would be low under the NA Alternative, low to moderate under Alternatives A and B, moderate under Alternatives C and D, and high under Alternative E and the PRMP.

Floodplains and Hyporheic Zones

Floodplains temporarily store floodwaters thereby reducing the risk of downstream flooding. Standing and downed trees and other vegetation create roughness of the floodplain surface and contribute to reduced stream velocities during high flows. Floodplain functions could be adversely effected by management activities that result in vegetation removal or surface disturbance. Adverse effects include less water storage capacity and subsequent increases in flood heights downstream. These activities would also make streambanks more susceptible to erosion by high water velocities.

Subterranean invertebrates thrive in a maze of underground channels that flow among the gravels, sands, and rock that underlie and are adjacent to many streams and rivers (i.e., hyporheic zone). For most of the lower order streams, the extent of hyporheic zones is fairly limited due to the narrow valley floors along these headwater channels. The extent of the hyporheic zone generally increases with increasing stream order, with the widest zones occurring along major rivers such as the Rogue, Applegate, and Illinois. Management activities that disturb the soil surface or lower the water table of the hyporheic zone could adversely effect the abundance and composition of the subterranean invertebrate population and subsequently effect aquatic organisms higher in the food chain.

Protection of floodplains and hyporheic zones would depend on the extent of these areas and would vary by alternative. The extent of floodplains and hyporheic zones is fairly limited in lower order streams. Alternatives with the greatest protection of riparian vegetation would have the highest probability of adequately protecting floodplains and hyporheic zones. Therefore, the least protection would be provided under the NA Alternative and the greatest protection would be under Alternative E and the PRMP. The remaining alternatives would fall in the middle with protection progressively increasing for Alternatives A, B, C, and D.

Floodplains and hyporheic zones extend 1,000 feet or more from some large streams and rivers with wide valley bottoms. Land available for timber management is minimal in these areas under all alternatives. Floodplains would be included within Riparian Reserves for large streams and rivers under the PRMP (FSEIS page B-86). If timber harvest occurs where floodplains or hyporheic zones are wider than RMAs allocated by an alternative, protection would not be adequate to maintain the functions of these areas. Based on the RMA and Riparian Reserve widths for sixth order and larger streams and the amount of land not available for timber harvest, it is likely Alternatives NA, A, and B would protect the fewest acres of floodplains and hyporheic zones; Alternatives C and D would protect more acres; and Alternatives E and the PRMP would protect the most acres. The PRMP is expected to have the least impact on floodplains and hyporheic zones.

Edge Effects

Vegetation removal in areas adjacent to riparian zones would adversely effect riparian microclimate conditions. It is assumed stable microclimates require buffer widths of approximately 400 feet on each side of the riparian zone (see Chapter 4, Biological Diversity). Adverse effects on riparian microclimate conditions include higher air temperature and lower humidity which could cause a shift in plant species composition from shade tolerant to intolerant species.

Removal of stands adjacent to riparian zones also leaves riparian vegetation susceptible to wind damage and wildfire. Large amounts of downed or burned trees in a riparian area can decrease the sustained input of CWD to the forest floor and stream channels and reduce canopy cover.

It is likely that vegetation removal in areas adjacent to RMAs or Riparian Reserves would adversely effect riparian microclimate conditions under all alternatives, however, the severity of microclimate changes would vary by alternative. Effectiveness of RMAs or Riparian Reserves in controlling microclimate factors such as air temperature, light intensity, and humidity would progressively improve from the NA Alternative through the PRMP. In addition to having narrower RMAs, Alternatives NA, A, and B would harvest a larger number of acres and probably have an adverse effect on microclimate changes in a greater percentage of riparian zones than the other alternatives. Wider RMAs under Alternatives D and E, and Riparian Reserves under the PRMP would provide the greatest protection of riparian zones from adverse changes in microclimate condition. Partial retention silvicultural systems implemented under Alternatives C, D, E, and the PRMP would lessen the edge effect from harvest adjacent to riparian zones. The large amount of land unavailable for harvest under Alternative E would also contribute to reducing adverse edge effects.

It is likely some increase in wind damage would occur in RMAs or Riparian Reserves under all alternatives. Windthrow in RMAs or Riparian Reserves is primarily a function of topography, riparian zone orientation relative to wind direction, and RMA or Riparian Reserve width (Steinblums, Froehlich and Lyons 1984). RMAs less than 100 feet wide would have the greatest potential for windthrow. Potential for windthrow would be reduced with the structural retention silvicultural system under Alternative C, the partial cutting regimes under Alternative D, and the southern silvicultural system under the PRMP.

Total loss of standing trees in individual RMAs or Riparian Reserves by a major wind storm is unlikely, however, it would have a severe effect on the riparian habitat. Stand structure would be greatly reduced and the riparian microclimate drastically changed. A more likely scenario would be loss of individual trees over many decades. Wood in stream channels seldom adversely effects bank or channel stability and is generally beneficial.

Prescribed fire in harvest units adjacent to RMAs or Riparian Reserves would likely enter the RMA or Riparian Reserve, but in most cases the adverse effect would be minimal. Fire in RMAs or Riparian Reserves, especially on sites with large concentrations of downed wood, may burn at a high intensity and result in localized loss of organic matter (including CWD) and reduce streambank stability. Generally, air temperature, humidity, and fuel moisture conditions within RMAs or Riparian Reserves limit the occurrence of high intensity burns, however, there would be some loss of riparian vegetation.

Implementing BMPs to lower fire intensities and underburning would reduce adverse effects, but prescribed fire would still result in a reduction of riparian vegetation density. The potential extent of this loss would be greatest in Alternatives A and B, which have the most acres scheduled for prescribed fire; less in Alternatives NA, C, and D; and lowest in Alternative E and the PRMP.

Under all alternatives, the potential for wildfire would increase in RMAs or Riparian Reserves over the long term due to openings created by harvest of adjacent stands and an increase in fuel loading caused by fire suppression.

Conclusion

Overall protection of riparian zones adjacent to management activities would be lowest in Alternatives NA, A, and B; greater in Alternatives C and D; substantially greater in Alternative E; and greatest in the PRMP. The cumulative amount of CWD on all streams within the planning area would be less than that estimated in Table 4-RZ-3, because riparian protection on non-BLM-administered land is less than that analyzed under the alternatives.

Proper functioning condition for riparian zones along first order intermittent streams would likely decline under all Alternatives except E and the PRMP, where it would be maintained or improved due to effects of management allocations and activities on riparian vegetation and CWD. Effects of management allocations and activities on riparian vegetation and CWD would likely cause the proper functioning condition of riparian zones along second order intermittent streams to decline under Alternatives NA, A, and B; be maintained under Alternative C; and improve under Alternatives D, E, and the PRMP.

For riparian zones along all other streams (first and second order perennial, first and second order intermittent with fish, and all third order and larger streams), proper functioning condition would likely be maintained under Alternatives NA, A, and B; maintained or improve under Alternatives C and D; and improve under Alternative E and the PRMP due to effects of management allocations and activities on riparian vegetation and CWD.

The recovery rate of riparian areas would be fastest under Alternative E and the PRMP. For the PRMP, the recovery rate may be slower in non-key watersheds than in key watersheds due to less area allocated to Late-Successional Reserves, Congressionally-Reserved Areas, and Riparian Reserves, combined with the fact that Key Watersheds have the highest priority for restoration efforts (FSEIS page 3&4-68). Under Alternative E, the large amount of land unavailable for harvest would contribute to the faster riparian recovery rate.

Under the PRMP, Riparian Reserves on all permanently-flowing streams are wide enough to provide a full array of ecological functions by including the floodplain and unstable and potentially unstable lands within the reserves. Riparian Reserve widths on intermittent streams are estimated to be fully effective for maintaining and restoring the natural disturbance regime and the full array of ecological functions. There is a greater risk to aquatic and riparian habitat from the narrower reserve widths on intermittent streams because watershed analysis is only required in Key Watersheds before initiating management actions. The risk is that potential Riparian Reserve trees would be harvested prior to completing the watershed analysis and their possible subsequent inclusion within the adjusted Riparian Reserve. This could negatively affect the aquatic habitat and could delay achieving full function and process of that particular riparian area and aquatic habitat (FSEIS page 3&4-68).

A key component of the PRMP is the Aquatic Conservation Strategy. The overall intent of the Aquatic Conservation Strategy is to restore and maintain the ecological function and processes of watersheds and aquatic ecosystems within natural disturbance regimes. Regulating management within Riparian Reserves according to the Standards and Guidelines in the SEIS ROD is an integral part of the Aquatic Conservation Strategy (FSEIS page 3&4-68).

Effects on Wildlife

Effects of the alternatives on some priority wildlife habitats and species were estimated using habitat models (USDI BLM 1991), information in the scientific literature, or personal communication with experts. Some of the models have been previously published, for example, elk (Wisdom et al. 1986) and cavity dwellers (Brown 1985). Others were derived by BLM biologists and planners specifically for this and other western Oregon RMP/EISs. Short term effects of timber harvest were based on the 10-year timber scenario and outputs from the TRIM-PLUS model for Alternatives A-E but were estimated for the PRMP. Long term effects were estimated using assumptions of habitat conditions and age class distributions expected under silvicultural systems and ORGANON growth model outputs. The assumptions and analytical approaches for detailed models are found in Appendices 4-WL-1 and 4-WL-2, Draft RMP. Habitat relationships for wildlife species follow those described by Brown (1985).

In this section, general effects of major land use activities are described, followed by detailed analysis of effects of the alternatives on selected priority habitats and species. Some seral stages and species (such as mid-late seral stages, blue grouse, and others) are not described in detail because the effects are considered to be inconsequential or the effects would be similar under all alternatives. A summary of the effects of the alternatives on wildlife habitat is presented in Table 4-WL-1.

Timber management effects wildlife primarily by modifying habitat. Thomas (1979), Brown (1985), Ruggiero et al. (1991), and others have indicated that certain wildlife species are associated with forests of a particular age class and structure. Short term and long term changes in age class distributions are displayed in Figures 4-BD-1, 4-BD-2, 4-BD-3, and 4-BD-4 and discussed in the Biological Diversity section of this chapter.

Roads have major effects on wildlife habitat by removing vegetation within rights-of-way (BLM roads and roads constructed under reciprocal rights-of-way agreements) and by disturbing wildlife due to increased human access. Big game species are especially vulnerable to these road effects (Brown 1985).

Mining activities could also alter habitat conditions, especially in riparian habitats. The acreage effected is much smaller than those effected by timber harvest, but the local effects to special habitats such as serpentine outcrops, talus areas, and meadows could be severe.

Recreational development could result in habitat loss or alteration, but the primary effects are associated with increased human disturbance to sensitive habitat areas such as nest sites, winter ranges, and hibernacula caves.

Fire management effects wildlife habitat in three major ways. Prescribed burning removes vegetation and logging slash and resets the plant community to an earlier seral stage. When used in conjunction with timber harvest as a site preparation technique, burning increases the available forage for big game and other herbivores, and it helps speed the reestablishment of conifer stands. Burning can also be used in big game management areas, old growth reserves, and other habitats to maintain or create desired habitat conditions and reduce the risk of catastrophic wildfires. Fire suppression has resulted in seral changes in vegetative communities which created different habitat conditions and could eventually lead to increased risk of catastrophic fires.

The major effects of the alternatives on vegetation, riparian condition, seral stage distribution, and other habitat components are described in the Vegetation, Riparian Zones, and Biological Diversity sections of this chapter. Additional effects on some wildlife

Table 4-WL-1. Estimated Effects on Wildlife Habitats and Species[1]

Habitat/Species	Short term Long term	NA	A	B	C	D	E	PRMP
Early seral	ST[2]	+[3]	+[3]	+[3]	-	-	-	+
	LT[2]	+[3]	+[3]	+[3]	-	-	-	-
Mature/ Old growth	ST	-	-	-	-	-	+	-
	LT	-	-	-	+	+	+	+
Riparian	ST/LT	-	-	-	-	+	+	-
Special habitats	ST/LT	-	-	-	+	+	+	+
Coarse woody debris	ST/LT	-	-	-	-	-	-	-
Dominant woodpeckers	ST	-	-	-	0	+	+	0
	LT	-	-	-	+	+	+	+
Other cavity users	ST	-	-	-	0	+	+	0
	LT	-	-	-	+	+	+	+
Roosevelt elk	ST/LT	-	-	-	+	-	-	+
Black-tailed deer	ST	+	+	+	+	+	+	+
	LT	-	-	-	+	+	+	+
Amphibians	ST/LT	-	-	-	-	-	+	
Neotropical migrant birds	ST/LT	-	-	-	+	+	+	+
Osprey	ST/LT	0	-	-	0	+	+	0
Golden eagle	ST/LT	-	-	-	+	+	+	0
Great blue heron	ST/LT	-	-	-	+	+	+	+
Black bear	ST/LT	-	-	-	+	+	+	+
Cougar	ST	+	+	+	+	+	+	+
	LT	-	-	-	+	+	+	+
Accipiters	ST/LT	-	-	-	-	-	+	-

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[1] Effects are estimated to be positive (+), negative (-), or neutral or no effect (0), compared to existing conditions.

[2] ST: Short term = 10 years
LT: Long term = 100 years

[3] These alternatives create large amounts of early seral stage habitat which would provide abundant forage and open areas but would lack important habitat features such as snags and down logs.

species are discussed in the Special Status Species section of this chapter.

Wildlife Species Associated with Early Seral Stage Conifer Forest Habitat

Effects of the alternatives on species associated with early seral stages would vary based on the amount of regeneration timber harvesting that would occur under the alternatives. The amounts of early seral stage habitat available in the short term and long term are shown in Figures 4-BD-1 and 2.

Under Alternatives A, B, and the NA, a relatively intensive timber harvest program would result in the largest acreage of early seral stage habitat. Approximately 68 species within the planning area, which use this seral stage for their primary habitat, would benefit (Brown 1985). However, the lack of snags and coarse woody debris under these alternatives (Table 4-BD-4), compared with fire-regenerated stands would reduce the suitability of these habitats for 23 of these species such as clouded salamanders, western bluebirds, American kestrels, and others.

Alternatives C, D, E, and the southern general forest management area (SGFMA) of the PRMP would result in smaller amounts of early seral stage habitats, but the higher levels of snags, green trees, and coarse woody debris would mitigate some of the adverse conditions in Alternatives NA, A, and B (Tables 4-BD-5, 6, 7, and 8). However, these habitat features would still occur at much reduced levels compared with amounts found in stands regenerated by fire.

In addition, Alternative D and the PRMP would result in large areas being partial cut and would retain greater canopy closure. These actions would still result in some early seral stage habitat for many species but would reduce forage quality and quantity for big game and other herbivores and could otherwise reduce the habitat quality for some species associated with early seral stage habitats.

In summary, Alternatives NA, A, and B would result in large areas of early seral habitat, however, these areas would lack much of the large wood structure found in the other alternatives and in areas regenerated naturally by fire. The other alternatives would create much less early seral habitat but would retain more snags, large green trees, and coarse woody debris.

The shorter rotation lengths for timber management on nonfederal lands would result in additional early seral stage habitat on these lands. Since the age class distribution is not random, the availability of early seral habitat would tend to rise and fall over time. Thus, the cumulative effect of federal and nonfederal actions would result in adequate amounts of early seral habitat for most species. However, in Alternatives A, B, and the NA, the nonfederal lands would lack large snags and coarse woody debris; therefore, these alternatives would have a large adverse cumulative effect on the species associated with early seral stage habitats.

Species Associated With Mature and Old Growth Conifer Forest Habitat

Information on the wildlife species associated with late-successional forest habitat is discussed in the FSEIS in chapters 3 and 4, especially pages 158-190 and in Appendix J of this document. Late-successional forests include mature and old growth stands.

Wildlife species associated with late-successional forest habitats would be effected in relation to the amount, condition, and fragmentation of the habitat available (see Table 4-BD-1). In turn, the amounts and conditions of older forest habitat depend on the rate of timber harvest, the type of harvest, the successional processes as the stands grow older, and natural disturbance such as fire. For a complete discussion of the effects of the alternatives on the amount, structure, and block sizes of older forest stands, see the Biological Diversity section of this chapter. It is likely that little or no older forest habitat would be available on nonfederal lands in the short or long term.

Approximately 67 species within the planning area rely on mature and old growth habitats as a primary habitat (Brown 1985). Ruggiero and Lehmkuhl (1991) listed 93 wildlife species that are at moderate to high risk from reductions and fragmentation of older forest habitat in the Pacific Northwest. Of these, 86 species are found within the planning area. The FSEIS identified 191 wildlife species associated with late-successional habitat (p. 3&4-116, FSEIS), not including thousands of arthropod species. Most of these species are located within the planning area, but exactly how many is not clear since little is known about many of these species.

Species that have distributions confined largely to the Pacific Northwest and are associated with older forests are of particular concern because of their limited range and the widespread reduction in the availability of this habitat. Within the planning area this group includes: Pacific giant salamander, Olympic salamander, Del Norte salamander, Dunn's salamander, clouded salamander, tailed frog, Vaux's swift, band-tailed pigeon, northern spotted owl, chestnut-backed chickadee, varied thrush, hermit warbler, red tree vole, and others.

Some of the important habitat features for wildlife include high canopy closure, multilayered canopies, the presence and abundance of large trees, large snags and coarse woody debris, cooler and moist microhabitats, the amount of hardwoods present, and the abundance and diversity of underground fungi and epiphytic lichens.

Forest management activities that effect older forest habitat include complete removal through timber harvest; partial cutting, which opens up the canopy and removes canopy layers and hardwoods; and salvage logging, which removes snags, culls, and down logs. Fragmentation of older forests effects habitat by exposing areas along edges to hotter and drier air as described in the Biological Diversity section of this chapter. Also, fragmentation reduces habitat suitability for some species by increasing energy expenditures, predation, nest parasitism and increasing species competition with more general habitat requirements.

The harvest regimes and rotation lengths under Alternatives A, B, and the NA would not allow older forest habitat to develop on lands allocated to timber management. Under these alternatives, mature and old growth habitat would be restricted to highly fragmented, small blocks on lands in other allocations.

The old growth retention and restoration (R&R) blocks in Alternative C would provide 27,600 acres of old growth habitat in the short term, almost half of the 45,600 acres of old growth not available for timber management under this alternative. These blocks contain a total of 121,500 acres of forestlands, the bulk of which would provide mature and old growth habitat in the long term. However, a large number of these blocks would be too small to effectively function as old growth habitat.

The corridors in which these blocks are located would be managed to retain a relatively high canopy closure. For some species, such as canopy dwelling birds, small mammals, and perhaps for some amphibians and others, this level of canopy retention would continue to provide suitable habitat. This high canopy retention would also buffer the old growth blocks to some degree and reduce the heating and drying effects associated with abrupt edges.

However in the short term, this management regime would degrade habitat quality for other species to the point where they would no longer find suitable conditions. Brown cowbirds, great horned owls, and other habitat generalists would invade this habitat and could displace or prey upon species associated with interior old growth habitats. In the long term, this management regime would regenerate habitat conditions comparable to old growth stands within about 30 years after a regeneration harvest. Suitable habitat for northern spotted owls would also occur in about this same time frame. The corridors are designed to provide movement and dispersal habitat for species between significant reserves such as wilderness areas. Whether they would adequately function in this regard is unknown. Most literature concerning connectivity corridors has dealt with smaller scales such as riparian zones and urban greenways. The effectiveness of the corridors is further complicated by the presence of intermingled private lands (see Biological Diversity).

For small species with limited dispersal capabilities (such as salamanders, small mammals, mollusks and some arthropods), it is likely that these corridors would provide a higher level of connectivity compared with the relatively hostile conditions found in the managed landscape under Alternatives NA, A, B, and the northern portion of the PRMP. Outside of the corridors, the managed landscape under Alternative C would still pose substantial migration barriers to these species.

For more mobile species, these corridors could prove effective only to the extent they are able to use the resulting habitat for feeding or reproduction. It is just as likely these animals would attempt to disperse through the unsuitable habitat outside the corridors as they would successfully move through the corridors. However, it is clear that such corridors, four to five miles wide, provide less desirable conditions for dispersal and genetic interchange of wildlife species than providing dispersal habitat over the entire landscape as is the case in Alternative D, the southern portion of the PRMP, and to some extent in Alternative E.

Under Alternative D, the existing old growth habitat would be retained on approximately 24,300 acres within large Category 1 and 2 habitat conservation areas (HCAs), less than half of the 47,400 acres unavailable for timber management. Another 7,800 acres would be retained within smaller HCA-4s around individual nest sites. These HCAs were designed to provide habitat blocks for northern spotted owls, but other species would benefit. Dispersal for northern spotted owls between these HCAs would be provided by maintaining at least 50 percent of BLM-administered land in dispersal habitat conditions with at least 11-inch average dbh and 40 percent canopy closure. Dispersal across these areas for species with lower mobility such as salamanders and small mammals would be more questionable. However, the HCA-1s and 2s would be large enough that it is likely each one could be capable of maintaining viable populations of most of these species in the long term.

In Alternative E, 101,900 acres of existing old growth forest would be retained. However, since only the existing older stands are reserved in much of the landscape, older forest habitat would remain relatively fragmented. In addition, as these stands grow older, they would inevitably be subject to wildfire, insect mortality, and other disturbances. There is no provision in this alternative for replacing old growth habitat in this event. As a result, it is likely that older forest habitat would decline in the long term; however, this alternative would provide more old growth habitat than any other alternative.

Density management thinnings within LSRs under the RMP would accelerate the development of old growth conditions but could temporarily reduce habitat suitability for some species associated with late-successional habitat by opening the canopy and removing canopy layers. However, for most species, adequate habitat conditions would be maintained in the short term and enhanced in the long term.

In the northern GFMA under the PRMP, lands allocated to timber management would be managed on a 100-year rotation and 100-year minimum harvest age. Within these areas, old growth on lands allocated to intensive or restricted timber harvest would rapidly be harvested. After three or four decades in the northern GFMA, old growth habitat would be restricted to riparian reserves, connectivity/diversity blocks, administratively withdrawn lands, protection buffers for several species and core areas around northern spotted owl sites. These small, isolated patches of late-succession habitat do have value for several species, especially those with limited mobility (FSEIS pp.3&4-29). However, they often do not provide effective interior habitat for those species that require larger blocks.

In the southern GFMA under the PRMP, lands available for timber management would be managed on a 120-year rotation and are expected to regain most old growth characteristics within 100 years after a regeneration harvest. The silvicultural prescription calls for partial cutting or small patch cutting. Uniform partial cutting over a stand would generally alter the stand structure to the extent where it would no longer function as old growth habitat. The first entry with small patch cuts could retain old growth habitat characteristics for many species. Subsequent entries of additional patch cuts, which could be scheduled within 20 years of the first entries, would result in these stands no longer providing old growth habitat characteristics. As a result, lands allocated to timber management in this portion of the planning area would provide little or no old growth habitat within 20 to 30 years. Between 40 and 50 percent of the acres currently with merchantable trees would be entered in the first decade, either with commercial thinning or regeneration harvests. In addition, extensive thinnings under this regime would open canopies, reducing habitat suitability for at least some mature and old growth species for approximately 10-20 years.

On a landscape basis, the existing and projected acreage conditions and block sizes of older conifer forest habitat are presented in the Biological Diversity section. In assessing the overall effects of the alternatives on wildlife species associated with older conifer forests, the three primary factors involved are the total amount of habitat available, the degree of fragmentation, and the connectivity between habitat blocks. How the alternatives would effect these factors is summarized in Table 4-WL-2.

Alternatives A, B, and the NA would result in the least amount of mature and old growth habitat available, the lowest connectivity, and the greatest fragmentation of the alternatives. Most wildlife species associated with older forest habitats would be expected to decline under these alternatives.

Under the other alternatives, Alternative E and the PRMP would result in the largest amount of mature and old growth habitat in the short term. Alternatives C and D would be slightly less than Alternative E and the PRMP. In the long term, Alternatives C, D, and the PRMP would result in similar amounts of older forest but less than Alternative E; and all four of these alternatives would provide more late-successional habitat than currently exists.

Fragmentation and connectivity would be generally similar for Alternatives C, D, E, and the PRMP in the short term. In the long term, Alternative E would be

Tables 4-WL-2. Relative Effects of the Alternatives on Mature and Old Growth Wildlife Habitat

Habitat Factor	NA	A	B	C	D	E	PRMP
Short Term							
Amount	Low	Low	Low	Mod	Mod	High	Low
block size[1]	Low	Low	Low	Mod	Mod	Mod	Low
connectivity	Low	Low	Low	Mod	Mod	Mod	Low
Long Term							
Amount	Low	Low	Low	Mod	Mod	High	Mod
block size[1]	Low	Low	Low	Mod	Mod	High	Mod
connectivity	Low	Low	Low	Mod	High	High	Low

[1] Block size is one indication of degree of fragmentation.

expected to result in the largest amount, better connectivity, and lower fragmentation than the other alternatives.

In conclusion, while the characteristics of the older forests found in the long term would differ under Alternatives C, D, E, and the PRMP, it appears likely that species associated with these older forests would be maintained. It is possible that they may increase slightly under Alternative E.

There is a concern that some species would show a delayed population response to habitat reduction (Thomas et al. 1990; Ruggiero et al. 1991). This could be particularly true for long-lived species such as northern spotted owls or fishers. In this case, it is likely that some species would continue to experience population declines within the first two to five decades before recovery commences. There is a possibility that such a decline may be severe enough to lead to local extinctions and no recovery would be possible. However, only in the case of the northern spotted owl has this scenario been analyzed (see northern spotted owl portion of this section).

Riparian Wildlife Habitat

The following discussion focuses on riparian zones as wildlife habitat. These areas along streams and water bodies provide important habitat for numerous wildlife species. Within the planning area, approximately 91 vertebrate species use riparian zones as their primary habitat (Brown 1985).

For a complete discussion of the effects of the alternatives on water quality or riparian vegetation and structure, refer to the Water and Riparian sections of this chapter.

The value of riparian zones as wildlife habitat would be effected in three primary ways.

- Direct removal of riparian vegetation due to timber harvest, mining, road construction, and other activities.
- Reduction of water quality (such as sedimentation and higher water temperatures) from surface-disturbing activities, as well as activities that remove vegetation.
- Alteration of micro-site characteristics within the riparian zone due to vegetation removal in the uplands adjacent to riparian zones.

The effects of the alternatives on wildlife habitat in riparian zones is summarized in Table 4-WL-3.

Removal of Riparian Wildlife Habitat

Alternatives A and the NA would result in the most extensive removal of riparian habitat and would occur on all stream sizes (see Table 4-RZ-1). Alternatives B and C would remove riparian habitat along first and second order streams. Alternative D would remove riparian habitat along first order streams. Alternative E and the PRMP would only remove riparian habitat when necessary for road construction.

Table 4-WL-3. Effects of the Alternatives on Riparian Wildlife Habitat

Stream Order	NA	A	B	C	D	E	PRMP
1	R,W,U[1]	R,W,U	R,W,U	R,W,U	R,W,U	U	R,W,U
2	R,W,U	R,W,U	R,W,U	R,W,U	W,U	U	R,W,U
3	R,W,U	W,U	W,U	W,U	U	U	W,U
4	R,U	R,U	U	U	U	U	U
5+	R,U	R,U	U	U	U	U	U
Lakes and Ponds	U	R,U	U	U	U	0[1]	U

[1] R: Removal of riparian habitat
W: Adverse effects on water quality
U: Effects of vegetation removal on adjacent uplands
O: No net change

The greatest effect of riparian habitat removal on wildlife habitat would be the loss of riparian habitat in the small, first and second order streams in Alternatives A, B, C, D and the NA. Timber harvest in these small headwater streams would have a substantial negative effect on wildlife species associated with these small riparian zones, especially amphibians, because of the large extent of the disturbance. This would also cause a large reduction of habitat diversity in the landscape compared with Alternative E, which would retain riparian habitat on all streams.

Riparian zones also provide connectivity between blocks of suitable habitat when the uplands have been harvested. These links would be far less effective in Alternatives A, B, C and the NA than they would be under Alternatives D, E, and the PRMP.

In conclusion, the adverse effects of removing riparian zone habitat would be greatest under Alternative A and slightly less under Alternatives NA, B and C. Of primary importance is the loss of riparian zones along first and second order streams. Alternatives D, E, and the PRMP would provide better protection to riparian habitat but would still have adverse effects caused by the edge effects associated with narrow RMAs within timber harvest units.

Water Quality and Wildlife Habitat

Activities that result in increased sedimentation, increased water temperatures, or otherwise reduced water quality would be expected to have a negative effect on several wildlife species (also see Fisheries in this chapter). Of particular importance are the effects on amphibians such as Pacific giant and Olympic salamanders and tailed frogs, red-legged and yellow-legged frogs, and Dunn's salamander (Bury 1987; Corn and Bury 1989) and on aquatic invertebrates.

Sediment in streams reduces habitat quality for aquatic amphibians by filling in small spaces between gravel, smothering eggs and larvae, and reducing the abundance of invertebrates on which they feed. It appears the major source of increased sedimentation under the alternatives would be the removal of first and second order streamside vegetation under Alternatives A, B, C, and the NA, and on first order streams in Alternative D (see Effects on Water Resources). Roads are also an important long term source of sediment.

Water temperature would not be adversely effected by BLM activities under any alternative except the NA, but could increase as a result of activities on nonfederal lands.

It is also unknown whether sedimentation, water temperature, and other water quality factors interact to create more serious effects on aquatic wildlife. For instance, a slight increase in water temperatures caused by timber removal on private lands could have a greater adverse effect on species that are already stressed by elevated sediment levels.

In conclusion, sedimentation under all alternatives would be expected to increase, but the extent which this would affect amphibian populations and other species cannot be quantified.

Effects of Upland Activities on Riparian Wildlife Habitat

The effects of timber harvest and other activities up slope from the riparian zone are discussed in the Riparian section of this chapter. Alternatives C, D, E, and the PRMP provide for RMAs or riparian reserves that are wide enough to serve as buffers for some riparian zones. However, wildlife riparian habitat would still be effected even in these alternatives through changes in vegetation composition, increased air temperatures, and drier micro-habitats.

Again, it is the amphibians and invertebrates that would be effected the most by these changes. Under the NA and Alternative A, the RMA width would be inadequate for all stream orders to provide the necessary habitat conditions for these species. The RMAs in Alternative B do not provide any protective buffer around the riparian zone and, therefore, would also not provide suitable habitat conditions.

Alternative C would provide more suitable habitat conditions for three reasons. First, RMA widths on order 5 and larger streams are wide enough to begin to ameliorate the heating and drying effects of adjacent harvest units and other openings. However, these large streams only comprise 4 percent of the stream miles in the planning area. Second, the high retention regime applied in the corridors and buffers around R&R blocks would reduce the exposure of the RMA to wind and direct solar influence. Third, substantially more acres and stream miles would be unavailable for timber management and would generally continue to provide good to optimal habitat conditions.

The same three factors also apply to Alternative D, except that wider RMAs would provide even more riparian zone buffering and provide for some suitable habitat conditions on order 4 and larger streams.

Alternative E and the PRMP provide the best protection of riparian habitat, both by allocating far fewer acres to timber management and by providing wide enough RMAs or riparian reserves to provide some suitable micro-habitat conditions on order 3 and larger streams. The southern regime of the PRMP would act to reduce edge effects. However, the green tree retention in the northern regime would not provide any additional mitigation from the heating and drying effects on the riparian zone. The Riparian Reserve widths are similar in both northern and southern regimes.

Riparian zones also provide travel corridors and hiding cover. Hiding cover for big game in these situations would be provided by RMAs extending at least 225 feet from the stream (Brown 1985). Only the largest streams, order 6 and above, would adequately function in this regard under Alternative C. Alternatives D, E and the PRMP would provide this measure of habitat for order 5 streams and larger. Again, this would be mitigated substantially in Alternative D, the southern regime under the PRMP, and within the corridors under Alternative C. With the partial cutting and high retention found in these systems, the effectiveness of the RMAs as hiding cover and travel corridors is greatly enhanced.

To summarize the overall effects of the alternatives on riparian wildlife habitat, Alternatives E and the PRMP would have the smallest adverse effects on riparian wildlife habitat of any of the alternatives. However, even these alternatives would have some level of adverse effect on wildlife using riparian areas by removing riparian vegetation along smaller streams and altering micro-site habitat characteristics through timber harvest in adjacent upland areas. Alternatives C and D would have greater adverse effects than Alternatives E and the PRMP. Alternatives A, B, and the NA would have the greatest adverse effects by removing riparian habitat, adversely effecting water quality by increased sedimentation, and by indirectly effecting the remaining riparian habitat. The greatest adverse effects under all alternatives would be the adverse effects of timber harvest on small headwater streams, orders 1, 2, and 3.

Special Habitats

This section focuses on the effects of the alternatives on special habitats, which include meadows, serpentine outcrops, springs and seeps, talus areas, caves, and cliffs. Numerous wildlife species use or depend on these habitat features (Brown 1985).

Any management activity that directly alters these habitat features or the ecotone (habitat edge) adjacent to them has the potential for diminishing their value as wildlife habitat. Ground-disturbing activities such as timber harvest, mining, recreational development, or off-highway vehicle (OHV) use could destroy vegetation in meadows, serpentine outcrops, and talus areas. Recreational use and other disturbance could reduce the habitat values for caves, meadows, and cliffs. Actions that alter ground water drainage patterns could alter or eliminate springs and seeps. Quarry development could directly effect talus areas, cliffs, and caves. Road construction could adversely effect any special habitats either through directly altering habitat conditions or increasing the potential for disturbance through additional human use. Removal of vegetation surrounding meadows, seeps, and talus areas could alter air flow and solar radiation resulting in adverse changes in temperature, humidity, and other microsite conditions.

Alternatives A, B, and the NA would protect special habitat features only when they would not conflict with timber management or other commodity production. There would be no protective buffer around special habitats. The most significant effects of these alternatives would be from ground disturbance and removal of vegetation in and near talus areas and meadows since these are relatively abundant and widespread throughout the planning area. These effects would lead to reduced habitat quality for species using these habitats. In the most severe cases, the habitat characteristics would be completely destroyed and that habitat would no longer function. Examples include road construction, which completely blocks a cave entrance or logging activity, which removes forest vegetation around a small meadow.

Alternatives C, D, E, and the PRMP would protect special habitats. The primary difference among these alternatives is the size of protective buffers to be afforded them in each alternative. The 100 to 200-foot buffers in Alternative C would provide adequate protection in most cases, but the 100 to 300-foot buffers in Alternatives D and E would probably provide optimal protection in virtually all cases. The PRMP would provide for 100 to 200-foot buffers in most cases but could be smaller if they were not necessary to provide adequate protection or could be wider if necessary. This flexibility could assure adequate protection but could also result in adverse effects on special habitats if site-specific management actions did not have the desired result.

Coarse Woody Debris

Approximately 67 wildlife species depend on large down logs as a key habitat component (Brown 1985). Clouded salamanders and others live in rotten logs; small mammals use these logs for runways, feeding, and den sites. The characteristics of coarse woody debris (CWD), which are important for wildlife habitat are the diameter and length of the logs, the decay class, and the total amount available. Larger logs last longer and provide more stable moisture conditions than smaller logs. Partially decayed logs allow salamanders, small mammals, insects, and other species to burrow through the logs and find adequate living conditions. Logs in advanced stages of decay also provide an important reservoir of moisture and nutrients. The levels of CWD found in undisturbed stands and the amounts projected to occur under the alternatives are shown in Tables 4-BD-3, 4, 5, 6, 7, and 8. The amounts of CWD needed to support various wildlife species is unknown.

The major effects of management activities on CWD are the removal of logs during timber harvest, additional removal during salvage operations, and the removal of standing trees and snags which would have provided down logs in the future. Fire management activities also effect CWD, as prescribed burning removes much of the material and changes the character of the remaining down logs if they are partially consumed.

All alternatives would result in a decline in the amount of CWD available in the landscape. This is an unavoidable and adverse effect since harvesting trees inevitably results in smaller numbers of down logs available in the future.

Alternatives A, B, and the NA would remove CWD over much of the planning area. Wildlife species, which require this habitat, would decline substantially under these alternatives.

Alternative E would effect much fewer acres than these alternatives so the effect would be far less. However, similar declines would occur on those lands available for timber management.

Alternatives C, D, and the PRMP would retain higher levels of CWD through reserving large blocks from timber harvest (i.e., R&R blocks, HCAs, and LSRs) or through retaining more standing trees, which would allow for more future recruitment of CWD.

Alternative D differs from the PRMP in that no salvage logging is allowed in the HCAs but is allowed within LSRs in the PRMP. It is unknown whether these levels of protection are adequate to support wildlife populations found in undisturbed older forest stands.

Cumulative effects of alternatives on CWD would be much greater than direct effects. Timber harvest on private lands is expected to result in little retention of CWD. The short rotations on these lands also do not allow trees to grow large enough to provide future sources of large down logs. In the long term, the bulk of this habitat would occur on federal lands.

Currently it is impossible to quantify how these reductions in CWD would effect wildlife population levels. It is likely that a reduction in down logs would result in lower populations of up to 67 species based on habitat relationships (Brown 1988). Amphibians and other species with limited mobility would probably at least show a direct, correlating decline. The decline may be even longer since there could be a significant lag time before these species could recolonize habitat once it had become suitable again. The effects of timber harvest on these species could be compounded since the riparian areas, where many of them breed, are likely to be effected at the same time down logs are being removed.

Dominant Woodpeckers

Within the planning area, dominant woodpecker species include the hairy, downy, and pileated woodpeckers, the northern flicker, the acorn woodpecker, and the red-breasted sapsucker. White-headed and black-backed woodpeckers may be found on the eastern edge of the planning area. All depend on excavating nest cavities in dead trees or live trees with dead tops or branches. The downy and pileated woodpeckers require these nest snags to be located within forested stands. The other species may nest in snags in more open habitats. Pileated woodpeckers and others require hard snags, while other species often use soft, decayed snags.

Effects of the alternatives on woodpecker habitat and populations were analyzed using a model developed by Neitro et al. (1985). See Appendix 4-WL-1, Draft RMP, for detailed results of this analysis and for more information concerning this model. This model is based on the numbers, sizes, and distribution of snags; the habitat in which they occur; and the habitat requirements of the species. The habitat information used in the model is based on age class distributions estimated from the TRIM-PLUS harvest model and the structure of stands described in the Biological Diversity section.

Targets for Alternatives A, B, C, D, and E are based on the density of snags available compared with the number of snags needed to provide for optimum population levels. For example, if three snags per acre are required for optimum numbers of a species, a target of 60 percent of optimum population levels would correspond to about 1.8 snags per acre.

The results of the analysis for BLM-administered land within the planning area are shown in Table 4-WL-4. It is assumed that species using early seral stages would be at less risk considering the large amount of this habitat occurring on private land. Therefore, this analysis concentrates on pileated woodpeckers and other species existing in forested habitats.

In the short term, Alternatives NA, A, and B would result in a reduction in populations of woodpeckers from the existing situation to about 45 percent of optimum levels on BLM-administered land. Alternative C would maintain current levels, and Alternatives D, E, and the PRMP would result in slight increases mostly due to the large acreage not allocated to timber management.

In the long term, Alternatives A and B would reduce population levels on BLM-administered land below 40 percent of optimum levels. It is likely these low population levels could not be maintained in the long term. Alternatives C, D, E, and the PRMP would result in increased population levels, well over 60 percent of optimum. It is very likely these higher levels would be stable over time, even considering the checkerboard ownership patterns throughout most of the planning area.

One species, the pileated woodpecker, involves special concerns. This species requires large (at least 15" dbh), hard snags in a forested condition for nesting. Many of the snags provided regardless of

Table 4-WL-4. Percent of Optimum Woodpecker Population on BLM-Administered Land Within the Planning Area

Year	NA	A	B	C	D	E	PRMP
10	54	45	46	53	61	57	52
100	54	32	38	75	69	83	70

alternative would decay quickly and become too soft to serve as suitable nesting material for this species. It is likely that the carrying capacity for this species is somewhat lower than the generalized figures in Table 4-WL-4. One implication is it may be necessary to kill large green trees throughout the rotation to continually replace hard snags that have decayed. In the PRMP, this is recognized and addressed by management direction.

Cumulative effects of the alternatives and actions on other lands in the planning area are expected to maintain low-snag abundance and cavity-user populations. Few large trees have been left on private lands clearcut in the last 30 years except in state-mandated buffer strips. This situation is likely to continue in the foreseeable future. For most of the planning area, the overall carrying capacity would be much lower than those shown in Table 4-WL-4; probably just over half those values, assuming BLM-administered land comprises about 50 percent of the landscape.

This would pose very real concerns for the long term viability of these species in the planning area under Alternatives NA, A, and B. Under the other alternatives, most species have a high likelihood of maintaining populations over time.

Other Cavity Users

Approximately 54 species within the planning area require tree cavities for portions of their life cycle (Brown 1988). Most of these depend on woodpeckers to excavate the cavities.

For those species associated with tree cavities within forested habitat, effects on habitat quality would parallel the effects on the dominant woodpeckers (see Dominant Woodpecker section).

However, several species are associated with more open habitats such as meadows, grasslands, or clearcuts. These species generally use soft snags; the species include western bluebird, American kestrel, house wren, and tree swallow. Retaining soft snags in timber harvest units is difficult. These snags are often knocked down or are cut down because they pose safety hazards to people working in the vicinity. The modeling used in the analysis assumed that half of the existing snags were lost during logging. Most of those successfully retained would be hard snags and less suitable for use by these species. Therefore in all alternatives, the bulk of the habitat for these species would be in more permanent, open habitats such as meadows, oak grasslands, and open pine stands. Under all alternatives, open, even-age harvest units would not retain many soft snags. Populations would decline in all alternatives. It is possible that new industrial safety standards would make it even more difficult to retain snags in harvest units. This could cause even larger reductions than are presently occurring.

Roosevelt Elk

Representative elk management areas were selected for detailed analysis of short term effects of the alternatives using the Wisdom Elk Model (Wisdom et al. 1986). See Appendix 4-WL-2, Draft RMP, for detailed results of this analysis. The Wisdom Elk Model is based on an analysis of forage and cover quality, interspersion of these habitats, and the amount of open roads. Effects of the PRMP were estimated based on other alternatives.

Overall, in the short term, elk populations in the planning area would probably increase slightly in Alternatives A, B, and the NA, as large areas of new timber harvest would create additional forage. However, this beneficial effect would be offset by an increase in the number of roads. The number of open roads is probably one of the primary limiting factors within the planning area.

Elk populations would remain stable or decline slightly in the short term in Alternatives C, D, E, and the PRMP since fewer acres would be available for timber harvest. The silvicultural prescriptions used in these alternatives would retain higher levels of tree canopy which reduce the amount of forage available. However, increased emphasis on closing some roads to motor vehicle use would be a substantial benefit under these alternatives.

Under the PRMP, four elk management areas in the Butte Falls Resource Area would not be afforded the special management activities and restrictions called for in Alternatives C, D, and E. In these areas, elk populations would not be expected to increase above existing levels.

Long term effects are more difficult to estimate since spatial arrangement of forage and cover cannot be determined. Also, it is more difficult to determine what habitat conditions would exist on nonfederal lands.

Elk populations would probably decline under all the alternatives in the long term, but for different reasons. In Alternatives A, B, and the NA, the high open road density and lack of optimal cover would have a negative effect. In Alternatives C, D, E, and the PRMP, forage quality or quantity would be the major limiting factor. This is especially true within HCAs or LSRs. Currently 2 of the 14 elk management areas are located within these areas.

An unavoidable adverse effect of all of the alternatives on elk habitat, except Alternative E, is the reduction in the amount of optimal thermal cover, which is considered an important component of elk habitat (Brown 1985). This reduction is considered an irreversible or irretrievable commitment of resources due to the length of time required in regenerating these stands. Reduced habitat quality as a result of elimination of optimal thermal cover would be expected to have long term adverse effects on the population size of elk herds.

Another unavoidable effect on elk habitat effectiveness is the inevitable failure of some road closures to reduce motor vehicle traffic. Experience shows that vandalism and deterioration would render some gates and other barricades ineffective. However, the intent under Alternatives C, D, E, and the PRMP would be to maintain and enforce these road management objectives as fully as possible.

Black-tailed Deer

Densities of black-tailed deer are currently high in the planning area. Cover would generally not be limiting under any alternative except in the Dead Indian area of the Ashland Resource Area where thermal cover is scarce on the summer range and in the winter range areas of the Cascade foothills (see Map 3-7). With these exceptions, deer numbers would be tied to available forage quality and quantity.

In the short term, the abundance of black-tailed deer would be relatively high in Alternatives NA, A, B, and the northern regime in the PRMP where extensive timber harvest would create abundant forage. The reduction in lands available for intensive timber harvest and the relatively high canopy retention levels in Alternatives C, D, E, and the southern GFMA of the PRMP would reduce the amount of forage. However, a large amount of timber cutting on private lands in recent years should also create abundant forage conditions for the next decade. Thus, deer populations would probably increase during the first decade under all alternatives.

However in the long term, black-tailed deer numbers are expected to fluctuate in response to the "boom-and-bust" phenomenon of forage levels resulting from even-aged management of timberlands in western Oregon (Brown 1985). This phenomenon is characterized by an initial high abundance of forage in response to overstory canopy removal, followed by low production of forage due to increasing shade from the overstory canopy. Deer populations tend to increase during periods of high browse availability only to crash when forage is scarce. In the long term, Alternatives NA, A, B, and the northern GFMA of the PRMP would probably maintain fluctuating populations of black-tailed deer. Alternatives C, D, E, and the southern GFMA of the PRMP would provide greater stability of black-tailed deer populations by reducing the amount of clearcutting and by increasing the availability of mature and old growth cover. The PRMP would probably result in a small increase in the numbers of black-tailed deer.

The added protection afforded migratory deer winter range in Alternative E and the PRMP would benefit deer populations in the Cascades and the Applegate River drainage by providing adequate thermal cover and reducing motor vehicle access into these sensitive areas.

Amphibians

The abundance and diversity of amphibians are related to the availability of suitable habitat conditions, which include stable, undisturbed riparian habitat along streams and ponds as well as talus and coarse woody debris, which help retain moisture. Water quality is also an important factor (Nussbaum et al. 1983; Bury 1987). The limiting factor for many amphibian species is the availability of water and moist substrates on land for breeding (Nussbaum et al. 1983). The quality and protection of riparian zones and the conditions of the associated uplands under the alternatives are major determinants in the quality of habitat for amphibians. For detailed discussions of the effects of the alternatives on water quality and riparian habitat, see the Water and Riparian sections of this chapter as well as the Riparian Wildlife Habitat portion of this section.

In the short term, amphibian populations would be expected to be highest under Alternatives D, E, and the PRMP; compared to Alternatives A, B, and the NA due to increased protection and improved condition of riparian habitats including protection of all first and second order streams. Alternative C would result in intermediate populations.

In addition, Alternatives C, D, E, and the southern GFMA of the PRMP would provide increasing protection of upland habitat, which would protect more of the small, headwater streams important to species such as the Olympic salamander and tailed frog (Nussbaum et al. 1983). Alternative E, in particular, would provide the best distribution of this habitat (i.e., at least one 40-acre block per section where BLM administers 50 percent or more of the land).

In the long term, riparian habitat conditions for amphibians would improve under Alternatives C, D, E, and the southern GFMA of the PRMP, as the streamside vegetation is allowed to grow toward a mature, stable, undisturbed condition. The other alternatives would result in declines in amphibian populations due to reductions in the amount of suitable habitat.

Cumulative effects of the alternatives and actions on other lands in the planning area are unclear. More riparian habitat should grow into more stable, mature forests on federal lands and as Oregon Forest Practices Act (OFPA) rules improve habitat on private land relative to the past few decades. It is unknown whether this would be adequate to offset the high rate of loss of upland habitat.

For additional discussion of effects on the Siskiyou and Del Norte salamanders, see Special Status Species section of this chapter.

Neotropical Migratory Birds

There has been increasing concern in recent years concerning apparent widespread population declines of bird species that migrate between Central or South America and North America (French 1991). Causes of the declines are unknown, but possible reasons include habitat loss on the breeding or wintering ranges, pesticide use, or other factors.

Because there are 48 species within the planning area (OR/WA Chapter PIF 1994) with varying habitat needs in this group, it is difficult to assess impacts. In general, the impacts on each species would be similar to the impacts on the type of habitat used for nesting and feeding.

There are 16 species of neotropical migrants found within the planning area, which are associated with early seral stages, and 13 species associated with conifer canopies.

Based on these groupings, Alternatives A, B, and the NA would provide more early seral stage habitat and would favor 16 species of neotropical migrants. However, these alternatives would remove large acreage of older forest habitat, which would have an adverse effect on about 13 species. Of these, it appears that band-tailed pigeon, Vaux's swift, Hammond's flycatcher, Swainson's thrush, black-throated gray warbler, Townsend's warbler, and the hermit warbler would be the species that would be most effected. Hermit warblers and Vaux's swifts are of special significance, since their breeding range is confined to conifer forests in the Pacific Northwest.

Alternatives C, D, E, and the PRMP would favor 13 species by retaining more older forest habitat or conifer canopy habitat.

Of particular concern with this group of species is the cumulative effects of the alternatives in conjunction with the large scale habitat changes created by federal and private timber harvest and land development in the Pacific Northwest along with habitat loss and pesticide use on the wintering grounds. It is quite likely that several of these species have experienced substantial population declines in the past few decades and are more vulnerable to future habitat changes. Long term monitoring and inventories are lacking in the western United States. However, no major declines have been conclusively documented.

Osprey

Osprey abundance is most dependent on the prey base and the availability of suitable nesting habitat near reservoirs, lakes, and major rivers and streams. Although ospreys frequently nest in riparian areas, they also may nest in upland areas in proximity to large bodies of water. Approximately 10 percent of the ospreys along the Umpqua River nest in upland areas (Witt 1991). Upland areas would likely be effected by intensive timber harvesting to a greater degree than riparian areas which receive some protection (though varying) under all alternatives. In the short and long term, numbers of ospreys are expected to decrease under Alternatives A, B, and the NA; remain similar to the existing situation under Alternative C; and increase under Alternatives D, E, and the PRMP (see Table 4-WL-3).

Golden Eagle

The abundance of golden eagles in western Oregon appears to be related to both the availability of early seral stages as foraging sites and mature/old growth timber as nesting habitat. The golden eagle is a fairly adaptable species and apparently can nest in small blocks of appropriate habitat (Anderson 1989). In both the short and long term, Alternatives C, D, and E would likely result in maintenance of current levels of golden eagles because present populations do not appear to be restricted by nesting cover due to their adaptability. Foraging sites would likely be available on adjacent private lands even under these alternatives. Alternatives A, B, and the NA would likely result in decreased abundance due to elimination of older forest stands. The PRMP would likely increase numbers of golden eagles in the southern GFMA due to an increase in suitable nesting habitat, while their numbers would remain stable in the northern GFMA, an overall positive effect.

Great Blue Heron

Great blue heron abundance is related to the availability of suitable nesting habitat in riparian areas as well as in mature and old growth forests. In the short and long term, numbers of great blue herons are expected to decrease under Alternatives A, B, and the NA due to intensive timber management practices which result in lower availability of nesting habitat. Conversely, numbers of herons would be expected to increase under Alternatives C, D, and E due to increased availability of suitable nesting habitat. The PRMP would likely increase numbers of great blue herons because of additional nesting habitat provided in the southern GFMA.

Riparian habitat on private lands currently receives less protection than on federal lands; in addition, very little mature or old growth habitat remains on private lands. Oregon Forest Practices Act rules currently protect existing great blue heron rookeries to some degree, however, there is little allowance for maintenance of suitable nesting habitat. The cumulative effect of all alternatives would likely result in reduced numbers of herons.

Black Bear

Black bears are omnivorous and forage heavily on fruits, green forage, and tree cambium. Such foods tend to be more prevalent in younger seral stages. However, Noble et al. (1990) recently pointed out since black bears use large rootwads as den sites, they should also benefit from areas of mature forests and from policies which protect snags and dead and downed woody material. The authors further stated that reducing denning disturbance from road traffic and other sources would benefit bear populations. Thus, moderate to high populations of bear would be anticipated in areas with a good mixture of younger seral stages for food and mature stands for denning habitat.

In the short and long term, Alternatives A, B, and the NA would be expected to maintain moderate populations of black bears because of abundant forage. However, there would be a scarcity of snags and CWD for den sites. Alternatives C, D, E, and particularly the PRMP would provide slightly higher populations primarily due to additional denning habitat and reduced open road densities.

Cougar

Cougar numbers are most closely tied to the abundance of deer in forested habitats away from the populated valley floors, since deer are their major food item. Therefore, alternatives that benefit black-tailed deer habitat should at least maintain or increase cougar numbers in western Oregon (ODFW 1987). In the short term, cougar populations are expected to remain comparable to existing levels. In the long term, Alternatives A, B, and the NA would be expected to reduce current cougar populations because deer populations would widely vary over time in response to variable forage levels. Alternatives C, D, E, and the PRMP would provide progressive stability of deer numbers and would support potentially higher, more stable levels of cougar.

Accipiters

Cooper's hawks and sharp-shinned hawks use dense, unthinned stands for nesting (Reynolds 1983), primarily in the mid- and late seral stages (20-90 years old). Only in Alternative E is any provision made for retaining some of these stands in an unthinned condition. In this alternative, there are relatively few areas allocated to timber management, therefore, most stands would be older. In all the other alternatives, it is assumed that all stands on lands allocated to timber management would be thinned to increase timber yields.

Very limited amounts of dense young stands may be available in other allocations, however, most of these forests are older than this age range. The degree to which these species use dense hardwood stands within the planning area for nesting is unknown.

It appears that under all alternatives, except E, accipiter populations would decline due to a lack of suitable nesting habitat. The extent and significance of this decline is unknown. Under Alternative E, populations would remain similar to existing levels or increase slightly.

Dense, unthinned stands on intermingled nonfederal lands within the planning area are expected to be more prevalent than on BLM-administered land under all alternatives, which contribute additional accipiter habitat. This cumulative effect would be cyclical in many areas, however, as habitat conditions on private lands tend to be harvested within a span of a decade or less, leaving a period where they may provide little or no such habitat.

Conclusion

Overall, the most important effects of the alternatives on wildlife habitat within the planning area would parallel those described for mature and old growth habitat, riparian habitat, and the availability of suitable cavity and coarse woody debris habitat.

With this in mind, Alternatives NA, A, and B would have large-scale and serious adverse effects on wildlife species. Several species could show large population declines, perhaps leading to local extinctions.

Alternatives C, D, and the PRMP would also have adverse effects on several species, especially in the short term. In the long term, most species would find increased amounts of suitable habitat due to measures taken to maintain biological diversity and to increase the amount of mature and old growth forests. For these same reasons, Alternative E would result in the most beneficial effects on wildlife habitat overall.

Effects on Fish Habitat

Management of vegetation in a drainage basin is a primary determinate in the quality of the fish habitat. Vegetation controls the movement of water through the basin, maintains water quality, stabilizes upslope and channel areas, and provides structural material for the stream channel. The headwater 1st and 2nd order streams, which accounts for 75 percent of the total stream miles in the district, are the most geologically active part of the stream system and are important in determining downstream water quality. Timber management activities that change the forests' successional age have both a short and long term impact on the aquatic system.

Initial harvesting of timber in a basin usually has little or no impact on fish production potential in the basin. As a greater percentage of the basin is harvested, fish habitat may decline, sometimes quite rapidly, with cumulative impacts and extending downstream due to changes in hydrology, reduced water quality, and loss of large woody material. Retention of riparian communities and the use of best management practices (BMPs) for constructing roads and landings and protecting potentially unstable areas may prevent most potential habitat losses.

Large woody debris from the riparian area is one of the single most important factors that determine fish habitat conditions and greatly influences salmonid populations (Bisson et al. 1987; Brown 1985). Water quantity and low water temperatures are the single most important factors limiting fish production. Partial or total removal of large woody debris sources usually creates a reduction in the number and quality of pools, off-channel habitat, and gravels used by fish and other aquatic species (Andrus et al. 1988; Bilby and Ward 1989; Crispin et al. in press; Heifetz et al. 1986; House and Crispin 1990; House et al. 1989; House and Boehne 1987; House and Suther 1991). The input of large woody debris is a major link between terrestrial and aquatic ecosystems (Lienkaemper and Swanson 1987). A basic assumption in evaluating the quality of riparian vegetation is that mature riparian zones dominated by large conifers maintain or enhance stream channel conditions. Downed large trees provide instream habitat for fish by creating pools and backwater areas and retaining gravel deposits. They also improve water quality by trapping sediments, stabilizing stream channels, and slowing high flows.

Sedell et al. (1988), showed the number of downed trees and pieces of large woody debris varied with stand age of riparian zones. Streams flowing through young growth forests and recently harvested areas contained from one-fifth to one-twentieth the number of large woody debris pieces found in streams in mature forests. The width of a riparian protection area determines the potential amount of large woody debris in a channel. A 94-foot width is capable of providing most of the necessary large woody debris (Murphy and Koski 1989). A 164-foot width is capable of providing an optimum amount of large woody debris (Van Sickle and Gregory 1990).

The amount of large woody debris in stream segments with adjacent BLM-administered lands is slowly increasing. This trend is expected to continue in the short term for all alternatives, but the rate of improvement will be slow because most riparian areas are in early-successional stages and are dominated by deciduous trees. Full recovery of fish habitat potential depends on a substantial conversion of riparian vegetation to conifers and the growth of these conifers to mature size large enough to remain stable in the stream channel over time. Condition of stream habitat should improve substantially over the next 200 years, primarily from the increase in large woody debris (see Appendix CC).

For the streams included in a particular alternative, recovery depends on the width of the riparian management areas (RMAs) or riparian reserves. The length of time needed for recovery varies by the type of existing vegetation. The normal succession is a gradual change from shrubs, hardwoods, and young conifers to large conifers. Active management of riparian areas can accelerate the process of riparian recovery of stands to predominantly large conifers. These large trees would provide most of the large woody debris required for achieving optimum stream conditions.

Stream improvement and riparian conversion projects are proposed that would speed the recovery of the productive potential in the improved streams for all alternatives. Monitoring of existing habitat improvements show they can provide optimum habitat equivalent to unaltered streams. The projects would be undertaken only to address existing problems in the short term and would not be a substitute for restoring and maintaining stream channels and riparian areas through natural processes. Natural habitat has a much greater longevity than projects that last between 15 and 30 years.

The PRMP, which incorporates the Aquatic Conservation Strategy objectives of the SEIS ROD, provides the greatest protection of aquatic habitat. Compared to other alternatives, the PRMP provides wider riparian reserves and more protective measures for perennial and intermittent streams. Although watershed analysis can result in reduced riparian reserve widths for intermittent streams, this would only take place if the best information available shows that riparian reserve objectives can be maintained with reduced riparian reserve widths. By including greater protection of intermittent streams, the PRMP would provide for greater overall watershed protection of upslope, riparian, and downstream areas, than in other alternatives. This would help stabilize hydrologic function, water quality and, in time, large woody debris recruitment within the drainage. This is important because the cumulative effects of management actions on fish habitat over entire watersheds may be more critical than effects on any single component of fish habitat. Because of the uncertainty of funding for watershed restoration and activities on private land it is not possible to estimate how much the production potential would increase through watershed restoration. Fish production potential would be greater for stream and riparian area projects. Less production potential is anticipated from improvements to roads.

In the long term, aquatic habitat will continue to recover more quickly in Alternatives D, E, and the PRMP. Based on comparisons with the SEIS, recovery would occur more rapidly under the PRMP than under the other alternatives due to greater upslope reserves, less road construction, and wider riparian reserves particularly in headwater streams. Even if changes in land management practices and comprehensive restoration are initiated, it is possible no option would completely recover all aquatic systems within the next 100 years.

Coastwide coho salmon, steelhead, and cutthroat trout have been petitioned for threatened and endangered species status. Presently they are listed as Category 2 and are in the status review stage. Populations of these species continue to decline. BLM will contribute to protect these stocks and reduce the risk of adverse impacts to remaining high quality salmonid habitat in the Rogue and Umpqua rivers.

The productive capability for fish is directly correlated with the quality of habitat. As habitat improves, the productive potential of the habitat for fish also improves. The actual production of fish from streams on public lands is strongly influenced by actions of other ownerships and is currently well below the potential. Land use practices of other ownerships, which are generally less restrictive than on public land, may contribute to elevated water temperatures and sediment deposition on public land. Diversion of water from streams, which is regulated by the State of Oregon, is a major factor limiting productivity of many streams in the planning area.

Habitat recovery depends on regrowth of conifers in and adjacent to the riparian area to mature age classes, so large conifer trees are available to fall into the stream and create fish habitat. Because of the length of time needed for riparian vegetation recovery, natural recovery, which relies on creation of large conifer trees to produce large woody debris, will produce little change in the first decade. Productivity is similar for all alternatives in the short term, and is constant for Alternative A in the long term. In 3rd order and larger streams for sensitive species, such as salmon and steelhead, productivity would increase under Alternatives NA, B, C, D, E, and the PRMP. This analysis of effects incorporates by reference the conclusions of the SEIS. Specifically incorporated are conclusions about Alternative 9 of the SEIS. See the

Special Status and SEIS Special Attention Species section of this chapter.

Cumulative effects in regard to management of riparian habitat on private lands depend in part on guidelines of the Oregon Forest Practices Act. This act requires less retention of riparian vegetation and downed logs than is proposed under most alternatives on BLM-administered lands, particularly in smaller streams. Large trees and coarse woody debris are largely absent from streams. Therefore, a major cumulative effect of timber management in individual watersheds, especially those with large private holdings may be an overall reduced level of large woody debris and habitat for priority fish species over the long term.

Leasable mineral activities are not expected to adversely effect aquatic habitat because they are guided by the Aquatic Conservation Strategy objectives. Locatable mineral activity in the past decade has centered on streams and may reduce the opportunities to enhance fish habitat. Potential mining development may damage riparian areas and aquatic habitat by removing trees in the riparian area, increased siltation, degraded water quality, disturbance of spawning gravels, a decrease in substrate stability, increased scouring, and filling of pools.

Under all alternatives except A and B, land tenure adjustments described in Chapter 2 would permit increased control over important riparian and aquatic habitat, and increase the ability of the district to develop and implement aquatic habitat rehabilitation projects for anadromous and resident fish species. Poaching of steelhead, coho, and spring and fall chinook is a major problem in some accessible areas. Closure of roads in riparian areas would reduce the threat to these fish. Increased recreational development in some areas would increase access to spawning areas and the probability of disturbance and poaching of spawning fish. However, in most areas, recreation development would not have negative impacts on fish and would enhance fishing opportunities for resident and anadromous salmonids and other game species.

Effects on Special Status and SEIS Special Attention Species

Special status plant and animal species in the planning area are listed in Appendix G. The discussion of effects by alternative for special status plants is followed by discussion for special status animal species. Special status animal species are discussed individually. Refer to the SEIS for information on the effects of the SEIS alternatives on Special Status and SEIS Special Attention plant and animal species throughout the range of the northern spotted owl.

Common to all alternatives is the requirement to protect federal listed and proposed species as legally required by the Endangered Species Act (ESA). Management of other special status species differs according to the category of the species, whether it occurs on commercial forestland and whether the species is located on Oregon and California (O&C), or public domain (PD) land. Comprehensive inventories have not been conducted for special status or SEIS special attention species throughout the entire planning area. Inventories are done in conjunction with proposed surface-disturbing activities.

Plants

Direct and indirect effects to special status plants and their habitats could occur from a variety of activities that take place in the planning area in conjunction with management of other resources. These effects could alter the structure, function, and composition of both the special status plant species population and associated habitat. Activities with the greatest potential threats are those associated with timber management and mineral development. These activities could alter or eliminate habitats and individual populations of species through soil disturbance, soil compaction, and changing microhabitats by increasing light levels and decreasing relative humidity as a result of removing canopy cover. Construction of roads and development of rock quarries associated with timber and mineral management could eliminate habitats and individual populations of species through extreme disturbance and alterations of surface conditions. Other timber-related activities that change plant populations and associated habitat include vegetation control and fertilization. Vegetation management could effect habitats and individual populations through mechanical removal of undesired vegetation or nontarget effects of herbicide application. Fertilization could alter the nutrient status and nutrient cycling of a site by accelerating seral stage, which could change the competitive relationships between the special status plant species and other plants on the site.

Harvesting of minor forest products is expected to increase under all alternatives. Actions associated with this program could cause inadvertent damage to special status species through altering habitats, trampling on plants, and removing associated species (see Chapter 2, Timber Resources). These effects would be common to all alternatives.

Recreational development and the resulting activities could impact individual special status plants or populations through development of hiking trails, parking areas, and other visitor facilities. Activities such as off-highway vehicle use, mountain biking, hiking, and horseback riding could cause inadvertent damage to plant populations or plant habitats. Noxious weeds and other nonnative vegetation that would compete for space and nutrients could be introduced into areas by these uses.

How special status plant species are effected by disturbance is not well understood and data is often lacking to make effective management decisions. Some sensitive plant species may benefit while others may be adversely effected from different levels or types of human-caused disturbance. At this time, life history data is lacking on the 80 special status plant species known to exist in the planning area (see Appendix G).

Some types of disturbances such as prescribed fire may create habitat conditions similar to naturally occurring events and provide new habitat. Wildfire suppression could adversely effect the abundance and distribution of species through surface-disturbance activities and alteration of the nutrient cycling from application of chemical flame retardants. Use of prescribed fire to reduce hazard fuel levels and reintroduction of fire as an ecosystem process could have positive effects on special status species adapted to natural fire frequency and intensity.

For some sensitive plant species, acquisition or some other form of conservation strategy of a privately owned plant site could be critical to the long term viability of a species. This is particularly important for species that rely on other populations for exchange of genetic material. Where acquisition or conservation strategies are not pursued, nonfederal sites for special status plant species could be altered or destroyed. The long term consequence of this could be the loss of the viability of some species on BLM-administered land.

Seeding and planting of native or nonnative plant species to provide additional forage for wildlife and domestic livestock or to stabilize disturbed areas could affect populations of special status species by increasing competition of a site and by altering nutrient cycling when legumes or other nitrogen fixing species are planted.

Thirty-three percent of the special status plant species in the planning area occur on serpentine soils, which also contain valuable mineral resources. Under all alternatives, mineral development could adversely effect the habitat and plant populations by removing the overburden or altering the wetlands upon which many of these species are dependent. Many special status species also occur in special areas which afford some protection from mineral development under Alternatives C, D, E, and the PRMP (see Special Areas).

Continuing the designation of Woodcock Bog, Eight Dollar Mountain, and King Mountain as ACECs would provide some protection to special status plants associated with serpentine under all alternatives, except A. The designation of French Flat under Alternative E and the PRMP also would provide some protection to serpentine associated species by requiring a plan of operations for mineral development. The greatest adverse effects to special status plant species found in serpentine areas would occur under Alternative A where only one ACEC is designated.

At this time, there are no federally listed threatened and endangered plant species known to exist in the planning area. Under the NA Alternative, candidate and Bureau-sensitive species would be protected subject to valid existing rights. Protection of assessment species would not be required but would be encouraged to reduce the risk of these species becoming Bureau-sensitive or federal candidate species.

Under Alternative A, timber harvest and other activities associated with timber production could effect the quality and quantity of habitats of all categories of special status plants. Fifty-three percent of the special status species occur in forested and wooded ecosystems. Effects on some species could be positive. For example, Leach's Sophora, a federal candidate 2 species, occurs in forested ecosystems but is stimulated by canopy removal; however, no special protection or active management would be directed for these species. Loss of special status plant sites could lead to the need to list some of these species as threatened or endangered.

Effects under Alternative B would be similar to Alternative A, except for the additional protection provided on public domain (PD) land and by seral diversity blocks where timber harvest would be restricted. Habitat for two federal category 1 species, Dwarf meadow-foam and *Cook's lomatium*, would receive additional protection as BLM is the only federal ownership where they occur. Effects to their habitats through mineral development (subject to valid existing rights) and timber harvest would be mitigated, thereby reducing the potential for listing as threatened or endangered.

Effects under Alternative C would be similar to Alternative B, except varying sized blocks of mature and old growth forest would be selected where special status plants and animal species cluster. This would include 7,700 acres of restoration and retention (R&R) blocks allocated to special status plants in the Illinois Valley. Special status plant species would receive a 100-foot buffer on PD and noncommercial forestlands. Silvicultural prescriptions would be designed with the protection of ecosystem health and the retention of biological diversity as management objectives (see Appendix 2-T-1, Draft RMP). In addition, 1,090 known acres of special status plant species habitat would occur in designated special areas such as ACECs and RNAs. Many special status plant species are located in special habitats. Under Alternative C, these habitats would be buffered from surface disturbance (see Chapter 2, Wildlife).

Adverse effects under Alternatives D and E would be negligible. Known and future locations of special status plant species would be protected and buffered with a 200- and 300-foot buffer, respectively. Management of assessment species would not be required but would be encouraged to reduce the risk of these species changing in status to Bureau-sensitive or federal candidate species. Listing of species would be unlikely unless mineral development on BLM-administered land or activities on private land posed a threat that could not be mitigated. Effects to populations on private land could reduce a species to the point where recovery would be dependent on the population found only on public land.

The PRMP would provide protection to known and future special status species and the habitats on which these species depend. All management actions would promote recovery of listed species and no action would contribute to the need to list a species. The PRMP would provide active management for special status plant species and develop management strategies for maintaining long term population viability. As more information is gained about some of these species, research may suggest that management activities such as density management, prescribed burning, etc. could be compatible with reproducing the structure, function, and composition of habitats that support special status plant species. An area in the Illinois Valley would be designated a botanical emphasis area to highlight the outstanding botanical values. Thirty-nine percent of the special status plant species in the planning area are found in this emphasis area.

Conclusion

The effects resulting from the lack of protection and management activities in Alternatives A, B, and C could be detrimental to special status species. Several known special status plant populations would not be given specific protection under these alternatives, and sites located in the future would not be given protection. Over time, this could result in an irreversible and irretrievable commitment of these species in the planning area.

The NA and PRMP would adequately mitigate adverse effects in all instances subject to valid existing rights. Future listing of some plants could still occur due to adverse effects occurring on non-BLM-administered land or due to mineral development. Adverse effects to special status plants species would be least under Alternatives D and E, as these alternatives have the smallest amount of surface-disturbing activities and the greatest allocations to protection of special status plants species.

There is no protection provided to special status plants on private lands, however, many of the same plants are managed on neighboring National Forestlands. Modeling to determine minimum viable populations and extinction probability has not been used for special status plant species. It is unknown what percentage of a population could be eliminated and still remain viable. If activities reduced populations below minimum viable levels and the species did not have a sufficient soil seed bank to support rapid recovery, the population could become vulnerable to extinction. If recovery did not occur, these long term effects could result in an irreversible and irretrievable commitment of the resource leading to extinction of the species.

Animals

A summary of the effects of the alternatives on some special status animal species is presented in Table 4-SP-1. A detailed discussion of the federally listed species follows. For a discussion of special status fish species, see the Fish section of this chapter.

Table 4-SP-1. Summary of Effects of the Alternatives on Special Status Animal Species, Medford District BLM

Species	Status[1]	Alternatives						
		NA	A	B	C	D	E	PRMP
Gray wolf[2]	FE/SE ST/LT	O	O	O	O	O	O	O
Peregrine falcon	FE/SE ST/LT	O	O	O	O	+	+	+
Bald eagle	FE/ST ST/LT	O	O	O	O	+	+	+
Northern spotted owl	FT/ST ST	-	-	-	-	-	-	-
	LT	-	-	-	-	-	+	+
Marbled murrelet	FT/SC ST	-	-	-	-	-	-	-
	LT	-	-	-	+	+	+	+
Del Norte and Siskiyou	FC/SV ST	-	-	-	-	-	-	-
Mountains salamanders	LT	-	-	-	-	+	+	+
Western pond turtle	FC/SC ST/LT	-	-	-	-	O	O	O
Townsend's big-eared bat	ST/LT	-	-	-	O	+	+	O
Red-legged frog[2]	FC ST/LT	-	-	-	O	O	O	O
Spotted frog[2]	FC/SC ST/LT	-	-	-	O	O	O	O
Loggerhead shrike[2]	FC ST/LT	O	O	O	O	O	O	+
Mountain quail[2]	FC ST/LT	+	+	+	+	O	O	O
Redband trout[2]	FC ST/LT	-	-	-	O	O	O	+
Jenny Creek sucker[2]	FC ST/LT	-	-	-	O	O	O	+
Denning's agapetus caddisfly[2]	FC ST/LT	U	U	U	U	U	U	U
Green springs Mtn. farulan caddisfly[2]	FC ST/LT	U	U	U	U	U	U	U
Schuh's homplectran caddisfly[2]	FC ST/LT	U	U	U	U	U	U	U
Obrien rhyacophilan caddisfly[2]	FC ST/LT	U	U	U	U	U	U	U
Siskiyou caddisfly[2]	FC ST/LT	U	U	U	U	U	U	U
Franklin's bumblebee[2]	FC ST/LT	U	U	U	U	U	U	U
Oregon pearly mussel[2]	FC ST/LT	U	U	U	U	U	U	U
Siskiyou chloealtis grasshopper[2]	FC ST/LT	U	U	U	U	U	U	U
Oregon snail[2]	FC ST/LT	U	U	U	U	U	U	U
Fender's rhyacophilan caddisfly[2]	FC ST/LT	U	U	U	U	U	U	U
Fringed myotis[2]	BS/SV ST/LT	-	-	-	O	O	O	O

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[1] Federal listed by U.S. Fish and Wildlife Service and the National Marine Fisheries Service as of December 6, 1991.

[2] Species not discussed in this section.

Federal list:
FE: Federal endandered
FT: Federal threatened
FP: Federal proposed
FC: Federal candicate
State list:
SD: State depressed
SC: State critical
SE: State endangered
SP: State peripheral
ST: State threatened
SV: State vulnerable

BS: Bureau-sensitive
ST: Short-term
LT: Long-term
- : Decrease
O : No change
+ : Increase
U : Uncertain

Peregrine Falcon

Under all alternatives, adequate protection would be given to known nest sites to prevent disturbance which would result in reproductive failure.

Under Alternatives NA, A, and B, no protection would be afforded potential nesting sites. It is possible future nesting opportunities would be lost through development of rock quarries, road construction, recreational development, or other activities. Potential nest sites would be protected in the other alternatives, including the PRMP, which may allow for future population expansion and ultimately contribute to de-listing the species.

The effects of management activities on the birds' prey base is less well understood. Presumably, managing the landscape to maintain a diverse and abundant community of avian prey species would benefit peregrines.

Alternatives A and B would probably have a negative effect on prey availability. Important prey species such as northern flickers, which require snags, and American robins, which feed extensively on hardwood berries and fruits, would probably be reduced in number. In general, these alternatives would result in less diverse habitat conditions which may adversely affect prey abundance.

Effects of alternatives C, D, E and the PRMP are unclear, however, it is likely that there would be adequate prey to support peregrine populations in the short and long term.

Bald Eagle

Assessment of effects of the alternatives on bald eagle habitat is based on the number of potential bald eagle breeding sites which would be maintained under each alternative. All existing nest sites and two potential sites, which are identified under the Pacific Bald Eagle Implementation Plan (USF&WS 1989), would be protected under all alternatives. New nest sites and any winter roost sites which may be located in the future would also be protected.

Additional potential bald eagle habitat would be retained under each alternative. All alternatives would maintain several potential nest sites along the wild and scenic sections of the Rogue River.

In the short term, Alternatives NA, A, and B would provide the fewest number of potential habitat sites because they provide less protection for old growth and mature forests and riparian zones. Alternatives C, D, E, and the PRMP would provide higher levels based on increased protection of mature and old growth habitat and riparian zones.

In the long term, the availability of suitable bald eagle habitat would also depend on the amount of habitat allowed to regrow into old growth and mature forest habitat and riparian zones. Alternatives C, D, E, and the PRMP would provide some of this habitat in the long term; whereas Alternatives NA, A, and B would provide very limited potential habitat outside of the Rogue River corridor. Bald eagle populations would likely increase slightly in the long term under Alternatives C, D, E, and the PRMP due to increased availability of mature and old growth forest.

Cumulative effects of Alternatives NA, A, B, and actions on other lands in the planning area would likely maintain current low levels of bald eagle habitat and populations. Based on current Oregon Forest Protection Act riparian rules, bald eagle habitat and populations are not expected to increase from already low levels on private lands in both the short and long term. Since additional older forest and riparian protection would be available under Alternatives C, D, E, and the PRMP, the cumulative effects would result only in slightly higher amounts of bald eagle habitat and populations within the planning area. From a southwestern Oregon perspective, similar levels of habitat protection on other federal lands (e.g., national forests and other BLM Districts) would tend to result in modest increases in bald eagle habitat and populations over time.

Northern Spotted Owl

Information on the habitat and populations of the northern spotted owl is discussed in Chapters 3 and 4 of the FSEIS (pp. 211-245) and in Appendices G and J of this document. The discussions in this EIS will incorporate the FSEIS by reference and further supplement FSEIS information by subsequent discussions specific to the Medford District planning area.

Within the planning area, the primary land management activity effecting northern spotted owl habitat is timber management. Timber harvest may effect habitat suitability by removing stands of trees under a regeneration harvest prescription or it may be used for the long term benefit of habitat through selective cutting (thinning) of individual trees to promote tree growth and habitat diversification.

Other BLM-conducted or BLM-authorized activities that could effect northern spotted owls or their habitat include mining, road construction or other activities that remove or alter coniferous forests; blasting or other types of activity generating loud noise that could disturb nesting and ultimately reproductive success; granting of rights-of-way or road use permits that could lead to habitat loss on federal and non-federal lands; and land exchanges that transfer habitat to other ownership that would then be subject to timber harvest, land development, or other activity contributing to habitat loss. Conversely, land exchanges could transfer suitable habitat to federal ownership to be managed for the conservation of the species, particularly where the transfer would block up federal ownership.

This section will discuss the effects of the alternatives on suitable owl habitat, dispersal habitat, critical habitat and population levels.

Effects on Suitable Habitat

Aerial photography and timber inventory data were used to evaluate the BLM-administered forest stands in the planning area. Based on habitat information in the Interagency Scientific Committee report (Thomas, et al. 1990), two categories of suitable northern spotted owl habitat were identified:

> **Habitat 1** - Comprised of coniferous forest stands that satisfy the full complement of daily and annual needs of the owl for nesting, roosting, and foraging. These stands have a multilayered canopy of several species of coniferous trees with large trees in the overstory and an understory of shade tolerant conifers and hardwoods. The canopy closure exceeds 70 percent. There is a significant measure of decadence in the stand resulting from the occurrence of snags and broken-topped live trees along with dwarf mistletoe infections. The forest floor has substantial accumulations of large down woody material in the form of fallen trees.
>
> **Habitat 2** - Comprised of coniferous forest stands and some hardwood stands which provide roosting and foraging opportunities for northern spotted owls, but lack the necessary structure for consistent nesting. The roosting and foraging qualities are less than those described for Habitat 1 due to the reduced quality or complete absence of one or more of the components listed above (for example, the absence of large trees in the overstory or a reduced amount of down woody material on the forest floor). Habitat 2 stands generally have less diversity in the vertical structure and have either limited or poorly defined multi-layered canopy structure. The understory is somewhat open, allowing for owl movement and foraging. Canopy closure generally exceeds 70 percent.

Currently there are approximately 155,000 acres of Habitat 1 and 221,000 acres of Habitat 2, for a total of 376,000 acres of suitable habitat within the planning area. There is a concern that large expanses of Habitat 2, without any inclusions of Habitat 1 to provide nesting groves, would not provide the same level of habitat suitability as if there were a mixture of the two habitat types. Within the planning area and under all alternatives, there would be interspersion of the two types of habitat due to riparian buffers, timber production capability classification (TPCC) nonsuitable lands, natural vegetation patterns, past harvest patterns, and other lands not available for timber management. Based on this assumption, the two categories were combined for all analysis purposes.

Future habitat suitability was estimated by aging existing stands and projecting the location and timing of future harvests using the 10-year timber management scenario for the short term projections and random selection from lands available for harvest in each alternative for the long term projections. The effects of silvicultural prescriptions such as density management were also considered. A natural disturbance caused rate of habitat loss of 3.5 percent per decade for the Klamath province and 0.2 percent per decade for the West Cascades province was also included in the projection by random selection.

The projected development of future northern spotted owl habitat over time is given in Table 4-SP-2. In estimating the rate of development of future habitat, forecasts were more conservative for habitat development on existing stands regenerated following timber harvest due to the current lack of large trees and snags and typical single layered, evenly spaced, closed canopy conditions.

It was assumed that density management practices such as thinning in the restoration and retention (R&R) blocks under Alternative C (none is planned in the first decade) and the LSRs under the PRMP would not have adverse affects on attainment or retention of suitable habitat condition. Such harvests have the potential to accelerate development of suitable habitat, but the success of such treatments is unknown at this time.

Table 4-SP-2. Stand Ages or Time Following Regeneration Harvest When Suitable Northern Spotted Owl Habitat Would be Attained

	Age or Time Following Harvest
Unmanaged Stands[1]	
Naturally established	80
Established by even-aged harvest	80
Managed Stands	
Even-aged (Rotation 100 years or less)[2]	80
Restoration and retention blocks (Alt.C)	80
High retention regime (Alt. C)	30
Low retention regime (Alt. C)	80
Old growth emphasis areas (PRMP)	80
Connectivity Areas (PRMP)	80
Northern GFMA[3] (PRMP)	80
Southern GFMA (PRMP)	60

[1] Also applies to existing stands managed under approaches designed to emphasize biological diversity.
[2] Stands under this silvicultural regime might never attain suitable habitat conditions due to short rotation lengths.
[3] General Forest Management Area

The analysis assumed that in the future nonfederal lands would have no suitable habitat. This is a worst case scenario, but it is likely that it would be true for the vast majority of those lands as it is highly likely they will be managed on harvest rotations ranging from 50 to 80 years. These short rotations would yield little, if any, habitat capable of sustaining significant numbers of reproducing northern spotted owls.

Effects on Suitable Habitat Within Medford District Planning Area

Current acres of northern spotted owl habitat and future owl habitat projected for the district, by alternative, are shown in Table 4-SP-3. The data was stratified by northern spotted owl physiographic provinces (Thomas, et al. 1990; USDI 1991). The planning area occurs within the Oregon Klamath and West Cascades provinces. Since the No Action Alternative is not mapped in BLM's Geographic Information System data base, habitat data could not be calculated but the outcome would be similar to that of Alternative B. Similarly, acres for the PRMP are estimated based on comparisons to other alternatives.

Under all alternatives except Alternative E suitable habitat would decline on BLM-administered land over the short term. Between 10 and 50 years suitable habitat would recover to levels greater than the current situation under Alternative E and the PRMP. Alternatives C and D would recover to levels close to the current situation. Between the fifth decade and tenth decade, Alternatives C, D, E, and the PRMP would result in substantially more suitable habitat than is currently available; while Alternatives NA, A, and B would not contribute significant amounts of suitable habitat. In addition, connectivity/diversity blocks, northern spotted owl core areas and other protection buffers, and enlarged riparian reserves along intermittent streams under the PRMP would provide additional patches of high quality suitable habitat throughout the Matrix.

There is a level of uncertainty associated with the growth model projections under Alternative C. It is possible that stands under these management regimes would not attain suitable habitat as fast as projected, or conversely, they could reach those conditions in less time.

Effects on Suitable Habitat Within Western Oregon

BLM-administered lands currently provide approximately 23 percent of the suitable owl habitat

Table 4-SP-3. Suitable Northern Spotted Owl Habitat Within the Medford Planning Area, (1,000 acres)

Decade/Province	Current	A	B	C	D	E	PRMP
Current							
E. Cascades	0.2						
Klamath	268.6						
W. Cascades	73.5						
Total	342.2						
After 10 yrs							
E. Cascades		0	0	0	0	0	0.2
Klamath		17	21	243	248	264	257.1
W. Cascades		53	54	66	64	71	70.2
Total		70	75	309	312	335	327.5
After 50 yrs							
E. Cascades		0	1	1	1	2	1.2
Klamath		40	97	262	244	381	316.9
W. Cascades		6	24	71	77	110	85.9
Total		46	122	334	322	493	404
After 100 yrs							
E. Cascades		0	1	2	1	2	1.2
Klamath		45	23	438	359	456	399.3
W. Cascades		7	29	120	103	132	103.0
Total		52	53	560	463	590	503.5

[1] The NA Alternative is assumed to be comparable to Alternative B.

on federal lands in Oregon, compared with 74 percent on Forest Service lands (Table 4-SP-4).

As discussed above and shown in Table 4-SP-4, in western Oregon the Alternatives NA, A, and B would provide the least suitable habitat in the short and long term. Compared to the amount projected for Forest Service lands, the BLM would not contribute substantial habitat for northern spotted owls in the state under any of these three alternatives.

Alternatives C, E, and the PRMP would provide the greatest amount of suitable habitat in the long term, and alternative D would provide slightly less. BLM-administered lands would contribute 18-24 percent of the combined federal land suitable habitat under these four alternatives. The actual percentages on BLM-administered lands in Oregon are higher than those calculated since the Forest Service projections include suitable habitat in the California portion of the Klamath province.

The contribution of BLM-administered lands to the present and projected availability of suitable habitat in the different provinces varies substantially (Table 4-SP-4). BLM-administered lands are most important in the coast range, where these lands currently contain more suitable habitat than Forest Service lands and in the Klamath province. Under the No Action, A, and B Alternatives, suitable habitat on BLM-administered lands in both these provinces would be reduced significantly from current habitat levels.

In the long term in the coast range under the PRMP, BLM-administered lands would produce more than twice as much suitable habitat as currently exists and this total would again be greater than on Forest Service lands. In the Klamath province, BLM-administered lands would also show an increase in suitable habitat but are estimated to provide about one-half the acreage as on Forest Service lands. Alternatives C, D, and E would produce slightly less suitable habitat in the coast range province compared to the PRMP. The relative contribution of BLM-administered lands to suitable northern spotted owl habitat in other provinces in the long term compared with Forest Service lands is smaller than in the coast range.

Cumulative effects of past timber harvest on suitable northern spotted owl habitat were examined for private and federal lands. Habitat conditions in 1960, 1970, and 1980 were estimated based on birthdates of harvest units and assumptions of habitat depletion on private lands. Of particular interest in the planning area is the rapid and substantial reduction in suitable habitat in the southern Cascades and in an east-west swath across the northern part of the planning area extending into BLM's Roseburg District. These areas also have been identified as regional areas of concern by the U. S. Fish and Wildlife Service (USDI, Fish and Wildlife Service 1991, 1992). Habitat loss in these areas due to past logging could have already resulted in a significant loss of connectivity between physiographic provinces and consequent reproductive isolation.

Table 4-SP-4. Suitable Northern Spotted Owl Habitat on BLM-Administered Lands in Western Oregon (1,000 acres)

Decade/Province	USFS[1]	BLM	BLM[3]					
			A	B	C	D	E	PRMP
Current								
E. Cascades	[2]	18.4						
Klamath	1,573	354.1						
Coast	243	294.9						
W. Cascades	2,206	280.9						
Total	4,022	948.3						
After 10 yrs								
E. Cascades	NA[4]		12	13	14	14	19	17.5
Klamath	NA		79	85	314	328	348	338.9
Coast	NA		190	208	272	290	290	287.6
W. Cascades	NA		198	210	262	260	277	262.7
Total	NA		479	516	862	892	934	906.7
After 50 yrs								
E. Cascades	[2]		1	6	22	9	36	16.4
Klamath	1,690		55	129	297	315	483	408.8
Coast	207		58	119	154	304	321	422.0
W. Cascades	1,728		38	96	178	236	320	297.1
Total	3,625		152	350	651	864	1,160	1,144.3
After 100 yrs								
E. Cascades	[2]		1	7	39	25	42	18
Klamath	1,840		65	62	596	442	588	541.3
Coast	245		82	151	558	402	431	694.2
W. Cascades	1,763		50	119	454	286	402	422.1
Total	3,848		198	339	1,647	1,155	1,463	1,676.5

[1] Date from USDA Forest Service (1992).
[2] Data was not available; acres are included in W. Cascade province.
[3] The NA alternative is assumed to be comparable to Alternative B.
[4] Data not available.

Effects on Dispersal Habitat

Habitats 1 and 2 provide for nesting, roosting, and foraging habitat and are concentrated in the habitat conservation areas in Alternative D and the Late-Successional Reserves of the PRMP. Also of importance is the condition of forest vegetation between the large blocks of suitable habitat as these areas serve as dispersal habitat for owls. In the PRMP, the Riparian Reserves contribute significantly to dispersal habitat and may also provide an added measure of nesting, roosting, and foraging habitat. Provision of forest habitat to permit movement of juvenile and adult owls between nest habitat clusters is important to facilitate replacement of deceased individuals by recruits from the pool of dispersing young and nonterritorial adults (Thomas et al. 1990; USDI 1992).

The Interagency Scientific Committee (Thomas et al. 1990) determined that under their proposed strategy, adequate dispersal habitat across the managed landscape was comprised of stands of high quality old-growth forest located within riparian buffer strips, sensitive soil areas and other areas not available for timber management, and other stands of mid and late-successional forest. In combination, these stands afford some level of security to nonterritorial owls as they exist in the landscape until they locate blocks of unoccupied suitable habitat and set up a territory.

The "50-11-40" rule was developed by the Interagency Scientific Committee to define a prescription for management of dispersal habitat under a strategy using large habitat blocks separated by distances of eight to 12 miles (Thomas et al. 1990). The rule calls for maintaining at least 50 percent of the land outside nesting habitat clusters in a forested condition where stands have an average tree size of at least 11 inches dbh and canopy closure of at least 40 percent. Although based on limited field data, this method has been used for assessing habitat for dispersal of northern spotted owls. Quarter-townships (nine square miles) were the suggested scale on which to assess this standard.

Effects on Dispersal Habitat Within the Medford District Planning Area

Within the planning area, there are distributed patches and strips of high quality old-growth habitat to meet the first component of dispersal habitat in most quarter townships. This would be the case in all alternatives, but Alternatives NA, A, and B would result in the least amount of these habitat patches.

The dispersal habitat condition of forestland outside of these patches and strips would vary dramatically among the alternatives. Alternatives NA, A, and B would very likely result in most, if not all, of the quarter townships within the planning area not meeting the 50-11-40 rule within three decades. This is due to the large amount of acreage available for timber management and a 60-year harvest rotation. Under these alternatives, dispersal habitat would be attained in managed stands approximately 40 years after regeneration harvest, but most of these stands would be subject to harvest again in the subsequent 20 to 30 years. Under these alternatives, large blocks of suitable habitat would not be available for clusters of nesting owls. Owls in this landscape would need to disperse long distances between reserve areas such as wilderness areas and Late-Successional Reserves on U.S. Forest Service lands. The increased distances involved would be likely to have a negative effect on both the survival rates of dispersing owls and the percentage that establish territories and reproduce.

Dispersal habitat conditions would be substantially improved under Alternative C, especially within the corridors where restoration and retention blocks and high retention silvicultural regimes would retain existing dispersal habitat and develop additional habitat. Outside the corridors the low retention regime would contribute to dispersal habitat in the long term as regenerating stands aged beyond 50 years. Overall, this alternative would probably meet or exceed the 50-11-40 rule in all quarter townships after five or six decades. As in the previous alternatives, dispersing owls would be moving greater distances between clusters of pair sites than in Alternative D and the PRMP. Generally, the quality of the habitat owls would be dispersing through would also be better. It would not only meet the 50-11-40 criteria, but in many instances would also meet the criteria for Habitat 1 or Habitat 2. Some of the restoration and retention blocks under Alternative C would be large enough to support reproductive pairs, but these would not be the large blocks called for in the Final Draft Spotted Owl Recovery Plan.

Alternative D portrays the Interagency Scientific Committee report recommendations and would require compliance with the 50-11-40 rule when planning timber harvest. The distance which owls would be required to disperse across the managed landscape would be much less under this alternative than any previously mentioned alternative due to the presence of the large Category 1 and 2 habitat conservation areas. The large habitat conservation areas, along with the improved dispersal habitat conditions, would facilitate adequate dispersal as prescribed under the Interagency Scientific Committee conservation strategy.

For Alternative E, dispersal habitat is likely to recover similarly to Alternative D and ultimately exceed the 50-11-40 rule on the majority of quarter townships. In most cases, the condition of the dispersal habitat would be far superior to the minimum levels found in Alternative D. Any quarter township not meeting the rule would likely occur along the valley margins and contain below average BLM ownership.

Under the PRMP, the reserve system is more extensive than that originally proposed by Interagency Scientific Committee or the Spotted Owl Recovery Team. This results in a smaller land area where dispersal habitat conditions would need to be considered and in some situations the reserves are much closer to each other than in Alternative D thus reducing, or even eliminating, the concern for dispersal habitat. The Riparian Reserves, which are an important component in providing dispersal habitat, are significantly larger under the PRMP compared to other alternatives. This results in benefits to dispersal habitat conditions by reducing potential harvest unit sizes and the amount of total land available for harvest. The dispersal habitat conditions under the PRMP will be adequate in the short term and improve over time on a track similar to that of Alternative D, and in the long term, exceed the conditions projected under Alternative D. As the U.S. Fish and Wildlife Service stated in Appendix G of the FSEIS, "the elements of alternative 9 (the PRMP) should enhance the dispersal situation in the long term as habitat grows back in areas previously harvested, both in and outside of Late-Successional Reserves. It would also reduce concerns in the short term since the amount of habitat subject to harvest would be less especially in areas where dispersal may be a concern" (p. 19). In future planning and implementation of the PRMP, if it is determined that there is a question of the adequacy of dispersal habitat conditions in a given locale, the BLM will informally consult with the U.S. Fish and Wildlife Service to evaluate the situation.

In conclusion, Alternatives NA, A, and B would result in the least effective dispersal habitat conditions of all the alternatives. Alternatives C, D, E, and the PRMP would provide adequate dispersal habitat conditions in the long term, but Alternatives C, E, and the PRMP provide more total acres. Under Alternative D and the PRMP, most quarter townships would be managed at the minimum level necessary to maintain or restore dispersal habitat on at least 50 percent of BLM-administered lands outside the reserves inherent in Alternative D. Both Alternative D and the PRMP would follow the same pattern of habitat availability, but the quality and quantity of dispersal habitat in the PRMP would ultimately exceed Alternative D.

The BLM checkerboard ownership pattern may yield cumulative dispersal habitat conditions that constitute less than 50 percent of the landscape. It is unknown if conditions in the checkerboard pattern under the PRMP will be sufficient to provide for successful dispersal of owls between suitable nesting areas. This situation was recognized by the Interagency Scientific Committee (Thomas 1990) when they recommended that the 50-11-40 rule be prorated by ownership for the first three years and then be re-evaluated "as it applies to multiple-ownership areas". The BLM will monitor habitat conditions and owl dispersal in an effort to provide insight into the adequacy of habitat conditions under the PRMP.

Effects on Critical Habitat

In 1992, the U.S. Fish and Wildlife Service designated 6.5 million acres as critical habitat for the northern spotted owl. The acres are arranged in 190 separate critical habitat units (CHUs) across the states of Washington, Oregon, and California. There are 76 critical habitat units in Oregon totaling 3.26 million acres of which 1.07 million acres are administered by the BLM. Within the Medford District planning area, there are 13 critical habitat units with a combined federal acreage of 346,997 acres.

Typical regeneration timber harvest under all alternatives would remove suitable habitat and in most cases also remove dispersal habitat. Harvest under the high retention regime in Alternative C and the southern GFMA prescriptions in the PRMP may retain dispersal habitat.

Of the 347,000 federal acres within CHUs, approximately 198,000 acres (57 percent) are also contained within LSRs under the PRMP. The largest blocks of critical habitat that would not be protected within LSRs in the PRMP occur in the Applegate drainage (CHU OR-74 and 75), and in the Glendale Resource Area (CHU OR-62, 64 and 67; and portions of OR-32 and 65). The Applegate CHUs are contained within the Applegate Adaptive Management Area in the southern GFMA; the others are located in the northern GFMA. In both these cases there is a relatively large gap between reserves across which the CHUs were intended to help facilitate movement. Not protecting critical habitat units in these areas may make successful dispersal between reserves and between provinces more difficult. However, the U.S. Fish and Wildlife Service concluded in their biological opinion on the

FSEIS that implementation of the PRMP would not constitute destruction or adverse modification of critical habitat based on the overall reserve network, the enlarged riparian reserves, the protection buffers, the provision to maintain a minimum level of late-successional forest habitat in each drainage, and other provisions in the proposal (Appendix G, p. 22).

All proposed actions that may affect lands designated as critical habitat would be consulted upon informally and, if necessary, formally with the U.S. Fish and Wildlife Service. For all alternatives, the BLM will not implement any action that the Fish and Wildlife Service determines through consultation would result in the destruction or adverse modification of critical habitat.

Effects on Populations

This EIS incorporates by reference the discussion and conclusions of the Final SEIS relating to analysis of northern spotted owl population trends in Appendix J3 and Chapters 3/4, pages 212 to 237, SEIS ROD. An in-depth discussion of the significance and context of demographic studies in the conservation of the northern spotted owl is provided in the FSEIS, pages 212 to 235. The following points summarize the key items from that discussion.

1) The overall results of the demographic analysis by Burnham et al. (1994) were not unexpected since the data was gathered during a time of habitat decline that was of sufficient concern to serve as a primary reason for the listing of the owl as a threatened species. Given this, it would have been surprising if the population had shown a stable or increasing trend.

2) The result that should be of most concern is the declining rate of adult survival. It is not possible to know with certainty what specific actions could be implemented to reverse the declining rate of adult survival shown in the demographic studies. This information does argue for a relatively conservative plan for owls, but whether the demographic results of these studies call for any more measures than what are contemplated in the proposed RMP is not known. These data, however, would support a decision to adopt a markedly more conservative approach to owl management in the PRMP (USDI unpubl. and Thomas et al. 1990).

3) Concerns were raised about whether the population of northern spotted owls could survive over the transition period until habitat recovery occurred. These were based largely on the finding of declining survival rates for adult female owls and the contention that the population may already have or is about to pass a threshold from which it cannot recover. In order for the northern spotted owl to be at or near such a threshold that would be passed resulting in extirpation of the species from large parts of its range as a result of harvest under the Proposed RMP, the following four conditions would have to be met.

a) Owl populations would have to be declining throughout all or most of their range.

b) Within the general areas where overall declines were seen, there would have to be no significant source areas that could provide for demographic rescue.

c) The factor, or factors, causing the decline would have to be operating in a similar fashion throughout all or most of the range.

d) The decline would have to continue as a function of habitat conditions until owl populations sizes and densities were reduced to the point that the populations could not recover.

There is additional discussion on each of these points in the FSEIS. This discussion concluded that:

1) While there is strong reason to believe that the owl populations have declined across much of their range, there is ample reason to believe that the pattern of population change is not the same everywhere.

2) There are areas within the range of the northern spotted owl with characteristics thought to be important to the productivity and stability of local populations and that such areas could act as sources for the owl population even in the face of an overall decline. Many of these areas are within the Late-Successional Reserves designated by the Proposed RMP.

3) It is unlikely that a single factor, with the exception of habitat loss, is primarily responsible for the declines in the owl population across the range. With the full range of environmental heterogeneity represented within reserves, there is reason to believe that owl population performance will vary in both positive and negative ways throughout the range. Given this it would be inappropriate to make a simple extrapolation from the current estimated rates of

decline in the owl population to single future projection of irreversible decline.

4) There is no part of the demographic studies that link them to either historic or projected rates of decline and there is no other evidence that the owl population losses will accelerate in the future or no empirical or theoretical basis for believing that the current habitat condition or condition of the owl population represents a unique threshold point.

The Draft RMP/EIS utilized a spatially explicit population model by McKelvey (1992) to evaluate the likely response of a model-generated owl population to a varying set of habitat situations characteristic of the range of alternatives. This model was subsequently used in the SEIS analysis. This EIS incorporates the discussion of that application found in Appendix J3 of the SEIS. As stated in Appendix J3, "Our results support the conclusions reached by the FEMAT in assessing likelihood of habitat conditions to provide for stable and well-distributed populations(measured against the owl's historic range) on federal lands over both the short and long term." The authors also stated that "The FEMAT based their ratings on an assumption that the amount and distribution of habitat would be sufficient to support a large enough population of owls to prevent passing an extinction threshold. Our simulation results do not prove this assumption correct (nor could they), but they do lend support to it for Alternatives 1 and 9 under the most likely rule sets." The standards and guidelines of Alternative 9 were embraced by the Proposed RMP.

Conclusion

Analysis of the information on population levels and the quantity and arrangement of suitable habitat on the landscape indicated that the alternatives in this EIS would likely have different outcomes for sustaining owl populations on BLM-administered lands in western Oregon and contributing to the long term stability (recovery) of populations within the range of the owl. For Alternatives NA, A, and B, the outlook for sustaining owls on the BLM-administered lands is near zero, thus virtually eliminating any contribution to the overall northern spotted owl population stability in the region. For Alternatives C, D, E, and the PRMP, the likelihood of sustained populations on BLM-administered lands is greatly increased and there would be an important contribution to the overall northern spotted owl population stability in the region. The contribution to recovery associated with each alternative varies because of the amount and distribution of suitable habitat and/or the amount and distribution of dispersal habitat in the first several decades of implementation. The level of contribution to the recovery of the northern spotted owl for Alternative D is about the same as implementation of the Final Draft Recovery Plan for the Northern Spotted Owl (USDI, 1993). On the other hand, the PRMP would provide a somewhat higher level of contribution to the recovery of the owl than the Final Draft Recovery Plan. The PRMP contribution as compared to D, is greater due to the large increase in suitable habitat that occurs. In the long term, the PRMP will exceed Alternative D in amount of suitable habitat and overall habitat capability. The lower expectation of contribution under Alternative C results from the uncertainty that silviculture will be successful in recreating habitat over large portions of the landscape. Under Alternative E, the allocations perpetuate the habitat conditions of today and do not afford opportunity for regrowth of habitat in areas presently deficient, thus resulting in a habitat area of lesser extent than Alternatives C, D, and the PRMP.

Marbled Murrelet

The assessment of impacts on the marbled murrelet focuses on the amount of suitable nesting habitat that would be available within 50 miles of the Pacific Coast in the short and long term. Suitable murrelet habitat was defined as conifer stands more than 150 years old, or stands with an overstory of at least 120 years with a well-stocked understory of at least 80 year old trees. Within the planning area, the 50-mile line roughly runs near Glendale, Wolf Creek, Merlin, Wilderville, and Holland. West of this line there are approximately 122,575 acres of suitable habitat available within the planning area. No murrelets have been observed within the planning area, however, only limited inventories, begun in 1993, have been conducted. The closest sighting was about one mile from BLM lands in 1994.

Table 4-SP-5 displays, by alternative, the current estimated acres of suitable nesting habitat, the projected loss of habitat due to timber harvest over the first decade, and the acres of land that would be expected to provide nesting habitat in the long term.

In the short term, all alternatives would remove suitable nesting habitat. Impacts would be expected to be greater under Alternatives NA, A, and B and less under C through E and the PRMP as a result of greater protection levels for the older forests in the latter alternatives. All stands occupied by murrelets would be protected under the PRMP. In order to identify occupied stands, all action areas within 50 miles of the coast subject to degradation of suitable nesting habitat would be surveyed to determine the

Table 4-SP-5. Marbled Murrelet Habitat Within the Medford Planning Area (1,000 acres)

Decade	Current	A	B	C	D	E	PRMP
Current	118,519	-	-	-	-	-	
After 10 years	-	28,500	31,800	108,500	109,600	112,432	113,929
After 100 years[2]	-	22,900	32,600	106,600	87,500	125,400	119,485

[1] The NA Alternative is assumed to be comparable to Alternative B.

[2] Projected estimates do not include habitat contained in riparian reserves, TPCC withdrawn lands and other non-mapped reserves within the Matrix.

murrelet occupancy status. For all alternatives, protection would be afforded to known occupied murrelet sites under the provisions of the Endangered Species Act.

In the long term, the availability of suitable nesting habitat would depend on the amount of older forest protected and the amount that will grow into suitable nesting habitat condition. It would also be influenced by the success of developing old growth characteristics through silviculture treatments which are planned under some alternatives, particularly C. Alternatives C, D, E and the PRMP would provide varying levels of nesting habitat in the long term; whereas Alternatives NA, A, and B would provide relatively limited suitable nesting habitat. Within 50 miles of the coast, Alternative D would provide two category 1 HCAs and the PRMP would provide 2 large LSRs, several individual-section marbled murrelet reserves and several connectivity/diversity blocks. These allocations would provide large blocks of suitable nesting habitat.

Based upon availability of nesting habitat, marbled murrelet populations would tend to increase in the long term under Alternatives C, D, E, and the PRMP due to the increased amounts of habitat. However, it is not clear how important the habitat within the planning area is in maintaining population levels or if nesting habitat this far inland is a limiting factor.

The cumulative effects of Alternatives NA, A, and B and the actions on other land ownerships would likely result in further declines in marbled murrelet populations due to the lower amounts of older forest having suitable nesting habitat conditions. Murrelet habitat and numbers of birds are not expected to increase from already low levels on private lands in the short or long term. Although additional suitable nesting habitat would be provided under Alternatives C, D, E and the PRMP, the cumulative increase would result in only slightly higher amounts of habitat and numbers of murrelets in the planning area. The FSEIS stated, "When all major factors affecting the species are taken into account, including at-sea and land ownership patterns, the murrelet panel concluded there is between a 50 and 75 percent likelihood that the murrelet population on federal lands will be stable and well distributed after 100 years, regardless of the alternative selected" (FSEIS p. 3&4-249). Thus from a western Oregon perspective, under the PRMP, the levels of protection projected for all federal lands would result in only a moderate increase in habitat and numbers of murrelets over time.

The U.S. Fish and Wildlife Service has proposed the designation of approximately 3 million acres of federal land in the range of the murrelet as critical habitat, including approximately 1.4 million acres in Oregon. It is estimated that this designation would involve approximately 83,000 acres in the planning area. This would have the greatest impact on the implementation of Alternatives NA, A, and B as proposed; moderate impact on Alternatives C and D; and the least impact on Alternative E and the PRMP. Under the PRMP, the proposed critical habitat within the planning area would be contained almost entirely within the LSR along the lower Rogue River.

Under all alternatives, the BLM will conference with the Fish and Wildlife Service on all actions that 'may adversely affect' proposed critical habitat. If it is designated, the BLM will consult on all proposed actions that 'may affect' critical habitat. The BLM will not carry out any action that is determined by the U.S. Fish and Wildlife Service to adversely modify or destroy designated critical habitat.

Siskiyou Salamander and Del Norte Salamander

These species are probably most directly affected by ground-disturbing activities and by removal of forest canopy over rocky areas or talus slopes which results in drier conditions at ground level. However, little research has been done on the habitat relationships for either species.

All alternatives would result in a reduction of available habitat in the short term, which would cause populations to decline. Subsequent population growth would depend on the rate at which habitat conditions are reestablished and how much habitat became available. However, there are concerns whether these species would be able to successfully disperse and recolonize new habitats where they had once been eliminated. In addition, it is likely that present population levels are probably considerably reduced from precontact levels due to extensive timber harvesting on both private and public lands.

Alternatives NA, A, and B would result in a relatively large number of acres of habitat in which the canopy would be removed through clearcutting or other timber harvest methods. It is likely that populations in these alternatives would be considerably reduced from the present level.

Alternatives C, D, and E retain more canopy closure over most of the landscape, either through allocating lands to resources other than timber production such as in HCAs and RMAs or through harvest prescriptions which retain more canopy. Where timber harvest is excluded, habitat conditions would not be effected and populations would remain suitable for these species.

The PRMP identifies these two species and calls for maintaining canopy closure of at least 40 percent and avoiding surface disturbance where they are located. These management standards should mitigate most adverse impacts on these occupied sites. There may still be short term adverse impacts on movements of individuals between sites, but the enlarged riparian reserves would facilitate this dispersal.

At this time, it is unknown whether the partial cutting systems in Alternatives C, D, and the southern GFMAs of the PRMP would retain adequate canopy closure to maintain suitable moisture conditions at the ground level. However, under Alternatives D, E, and the PRMP where these species are found, their habitat would be protected.

In all alternatives, there would be a large reduction in the number of acres of suitable habitat for these species as the canopy is removed, resulting in a decline in population numbers. It is likely that the extensive blocks of land allocated to northern spotted owl habitat or old growth habitats in Alternatives C, D, E, and the PRMP would result in stable population levels in the long term. However, the landscape habitat needs of these species are largely unknown. There are questions about whether they would be able to disperse across large areas of unsuitable habitat to recolonize new habitat as it grows back. Whether these blocks of old growth forests are large enough to support self-sustaining populations is unknown. The value of RMAs in a landscape of early seral stage or open canopy partial-cut stands is poorly understood.

It is likely that Alternatives NA, A, and B would contribute to the need for listing these species as threatened or endangered species under the ESA. However, until the habitat relationships of these species are better understood, is uncertain whether the other alternatives would also contribute to the need for listing.

Northern Goshawk

This species appears to be closely tied to mature and old growth conifer forests. Effects on this species are correlated to the amount of this habitat type under the alternatives. Alternatives A, B, and the NA would retain suitable habitat only on lands not allocated to timber management. Populations would be expected to decline substantially.

The low retention regime in Alternative C would remove habitat for 70 to 100 years following a regeneration harvest. It is unclear whether the high retention prescriptions in Alternative C would retain adequate habitat structure to support goshawk nesting. With the opening of the canopy and the frequency of disturbances, it is likely that these areas would be greatly diminished in their carrying capacity for this species. The partial cut regimes in Alternative D and the southern GFMA of the PRMP would probably not attain suitable goshawk nesting habitat until 60 to 80 years after a regeneration harvest.

The R&R blocks in Alternative C would be capable of supporting isolated pairs of goshawks in many cases. The large blocks of older forest provided by Alternatives D, E, and the PRMP would be capable of supporting multiple pairs for a relatively long time. The allocation of 40-acre blocks in each section in Alternative E would aid in providing suitable nesting core areas but would only be effective where located near other suitable habitat to provide foraging areas.

On a landscape basis goshawk populations would probably be most sensitive to the number of larger blocks of mature and old growth habitat. In the short term, Alternative E would result in stable or slightly higher population levels compared with the existing situation. Alternatives C, D and the PRMP would result in slightly lower populations. Alternatives NA, A, and B would result in slightly larger population declines.

In the long term, Alternatives NA, A, and B would result in substantial population declines, perhaps large enough to contribute to the need for listing as threatened or endangered species under the ESA. The other alternatives would maintain populations at or slightly above the existing situation.

Townsend's Big-eared Bat

The primary habitat features required by this species are the caves and mine shafts used for roosting. Under the NA, A, and B, known caves are given no specific protection. Under these alternatives, timber harvest, mining, and other actions around active roost sites could result in alterations of the air flow into the caves which could reduce their suitability either as summer roosts and nursery colonies or for winter hibernation. In addition, new road construction would increase the chances that human disturbance would also interfere with the bats' use of these caves. Recreational use would also be allowed under these alternatives; this often causes abandonment of the site. Under these alternatives, the population would probably decline. It is likely that these alternatives would contribute to the need for listing this species as threatened or endangered under the ESA.

Under Alternatives C, D, and E, the known roost sites are protected with a 30-acre buffer. This would eliminate the effects of timber harvest around the entrances. Recreational use of the occupied caves would be restricted to avoid disturbing the bats. Under these alternatives, the population would likely remain stable or only slightly decline.

Under the PRMP, active sites would be protected. The extent and type of protection would vary and would be based on site-specific circumstances. Under this alternative, the population would likely remain stable or decrease slightly.

Fringed Myotis

Fringed myotis bats, like several other bat species, often roost in loose bark and cavities of large trees and snags in forested habitats. However, little is known about their exact habitat requirements. There has not been a model developed to quantitatively predict effects on habitat or populations as has been done for woodpeckers.

The FSEIS ROD addressed the types of management direction would most benefit this and other bat species which include large forest reserve, riparian reserves, and retention of large green trees and snags in harvest units (FSEIS ROD p 3&4-189). On this basis, Alternatives NA, A, and B would have the greatest adverse effect on fringed myotis and other species by reducing suitable roosting habitat. Alternatives C and D would have short term adverse effects but would allow larger areas of older forest to develop in the long term. Alternative E would have the smallest adverse effects in the short term but would not allow for future habitat development in the long term. The PRMP would also have short term adverse effects on fringed myotis and other bat species, similar to Alternatives D and E. But in the long term, the larger reserves and retention of large trees and snags would allow suitable habitat conditions to increase over present levels.

Special Attention Species Associated With Late-Successional Habitat

The FSEIS ROD identified several species associated with late-successional forest habitat to be managed through specific standards and guidelines (see Appendix G). Management direction includes Survey and Manage (SEIS ROD pp. C-4 - C-6 and Table C-3), Managed Late-Successional Reserves (SEIS ROD pp. C-22 - C-28), protection buffers, and other provisions (eg. buffers around bat roost sites SEIS ROD p. C-43,44). Some of these species are also special status species and are discussed above.

In general, the effects of the alternatives on this group of species will be comparable to the effects discussed for late-successional forest habitat in the wildlife section of this chapter. Alternatives NA, A and B would have the greatest adverse effects by removing habitat and creating barriers to successful dispersal. The other alternatives particularly Alternative E and the PRMP would have smaller short term adverse effects and in the long term, these alternatives would provide much better habitat and connectivity conditions than Alternatives NA, A, and the current situation.

The Survey and Manage Standards and Guidelines in the PRMP in particular would provide a higher level of protection than any of the other alternatives. However, a lack of any information on some of these species (such as range, distribution and identification techniques for mollusks and insects) and funding shortfalls may preclude adequate implementation of these management standards and guidelines.

The larger riparian reserves along intermittent streams under the PRMP would also contribute to enhanced habitat conditions for these species. In addition, watershed analysis efforts, as called for in the PRMP, would also benefit these and other species by considering landscape patterns and ecosystem processes and functions on a more site-specific basis. Design of future management activities based on watershed analysis would include consideration of habitat conditions and connectivity.

Conclusion

In general, Alternatives NA, A, and B would have the greatest adverse effect on special status and special attention species. Alternatives C, D, E, and the PRMP would provide substantially better habitat conditions, especially in the long term since many of these species are associated with older forest or riparian habitats. However, there would be adverse effects on many species in the short term under all alternatives.

The PRMP highlights management standards and guidelines for several special status and special attention species associated with late-successional forests. Successful implementation would reduce adverse effects on these species compared with all other alternatives, especially in the short term.

Effects on Special Areas

Special areas contain qualities that make them fragile, sensitive, rare, unique or endangered, and are critical components for preserving biological diversity. RNAs, one type of special area, are part of an interagency program implemented to preserve natural diversity by establishing and protecting representative examples of natural ecosystems. These areas are used in comparison with systems being altered by humans, providing educational and research areas for ecological and environmental studies, and for preserving gene pools for typical as well as rare and endangered plants and animals. The SEIS states that, although not represented in alternatives as mitigating measures, designation of ACECs could benefit fungi and lichens.

Effects on existing and potential special areas (areas of critical environmental concern (ACEC), research natural area (RNA), and environmental education area (EEA)) could occur from management of other resources within the planning area. Timber harvesting, road construction, mineral development, and recreation use would have the greatest adverse effects on special areas. Seventy-six percent of the special areas are nominated for specific plant communities or primary values which are associated with forested communities.

The Table Rocks would be designated an ACEC/ONA in all alternatives. Therefore, dwarf meadow-foam, which is not protected by other authorities and is found nowhere else in the world, would be protected.

Timber harvest and other surface-disturbing activities could adversely effect RNAs, even though logging would not occur inside the designated boundaries. Disturbances are known to effect adjacent plant communities by changing environmental parameters such as light, temperature, relative humidity, soil moisture, and by reducing the amount of soil mychorrhizae (see Biological Diversity). Areas nominated for special status species and natural systems could have these primary values changed through altering the plant communities. Under Alternatives D, E, and the PRMP, buffers of 100 feet would be placed around two proposed RNAs (Grayback Glades and North Fork Silver Creek) to provide added protection from various activities. Because of its small size, Tin Cup ACEC (80 acres) could be influenced by edge conditions and could lack interior forest conditions. The other potential RNAs are of sufficient size to maintain interior conditions and reduce edge effect.

Effects from road construction and maintenance activities could consist of loss of special status species habitat or the species themselves by competition from introduction of nonnative vegetation, changes in hydrological regimes, and introductions of tree pathogens such as Port-Orford cedar root rot disease. Roads associated with reciprocal right-of-way agreements and mining could cause impacts that could not be mitigated.

No new roads would be planned in designated ACECs or RNAs under any alternative. Based on the 10-year scenario for timber management for Alternatives A-E, effects from proposed roads for the short term by alternative in nondesignated special areas varies from 84 miles in Alternatives A and B; 63

miles in Alternative C; 33 miles in Alternative D; to approximately 2 miles in Alternative E. No estimates of road locations were made for the PRMP, but those nominated ACECs not designated in the PRMP and located in Matrix lands would be subject to timber production and could be adversely impacted by road construction.

Construction of roads could increase the potential for unauthorized off-highway vehicle (OHV) use and the unauthorized harvesting of minor forest products. These activities could cause vegetation loss, soil erosion, and altering of plant communities. Roading in areas where the primary value is Port-Orford cedar could cause the introduction of root rot disease, which would destroy the value of the area through the infection and death of the trees.

Mineral development could adversely effect special areas by removal of vegetation and stock piling mined materials on special status plant habitat. Mining could alter the hydrologic process effecting the wetlands that many of the special status plants are dependent upon. Subject to valid existing rights, RNAs are proposed for mineral withdrawal for locatable minerals and no surface occupancy (NSO) for leasable minerals in Alternatives C, D, E, and the PRMP. Mineral development could occur within or adjacent to these areas under Alternatives NA, A, and B. This could effect the natural features the areas are intended to protect and would be an irreversible and irretrievable loss of those values. Designated ACECs, except the Table Rocks, in each alternative are not proposed for withdrawal from mineral entry but are proposed for NSO for leasable minerals.

Those potential ACECs occurring on nickel laterite, such as Eight Dollar Mountain and French Flat, could be adversely effected from mining through the clearing of vegetation and altering of hydrological regimes. The primary values that would be effected by mineral development activities are special status plant species and darlingtonia wetlands. Requiring a plan of operations for any development could help mitigate those impacts.

The primary beneficial effects of designating areas as special areas is to provide increased protection to primary values, increase management awareness, and increase public awareness of these valuable resources. However, the latter could, under some circumstances have adverse effects. Overuse from recreational, scientific, and educational groups, due to designation, could adversely effect plant communities and potentially introduce nonnative species into the areas.

Under the NA Alternative, two existing RNAs (Woodcock Bog and Brewer Spruce), three existing ACECs (Eight Dollar Mountain, King Mountain, and the Table Rocks), and three existing EEAs (Hidden Creek, Hollenbeck, and Listening Tree) would be retained. Thirty-four potential special areas would not be designated (see Table 2-6). These areas would be available for other resource development, and the primary values the areas were nominated for could be lost. Some protection would be provided by conditions such as nonforest or fragile site, and/or by allocations such as riparian management areas. Nine potential RNA cells, identified by the Oregon Natural Heritage Program, would not be filled using BLM-administered land, and an additional 1,384 acres would not be added to existing RNAs. These are the best-known localities where these cells could be filled. The failure to maintain these cells in a natural condition would diminish, if not destroy, their values for research. By failing to gain knowledge of ecosystem functions, the quality of future management may be diminished. This would be an irreversible and irretrievable loss of these values.

Under Alternative A, the Table Rocks would be the only special area designated. Seven existing and 35 potential special areas would be available for resource development activities such as timber harvest, road construction, and mineral development. These activities could cause the loss of or damage to special values for which the areas were proposed for designation. In the short term, approximately 11,000 acres could be subject to timber harvest in 7 existing and 35 potential special areas, and special values could be lost or damaged by ground- and vegetation-disturbing activities. Protection of two existing RNAs would cease, and nine potential RNA cells would not be filled using BLM-administered land.

Alternative B would designate all existing ACECs, RNAs, and EEAs. Round Top Butte would be designated an RNA, as it fills three terrestrial cells[1] in the Oregon Natural Heritage Program which are not found on any other federal ownership in southern Oregon. Thirty-three potential special areas would not be designated, and these areas would be utilized for other allocations. In the short term, about 10,000 acres of timber could be harvested and some, if not all, special values could be lost or damaged through changes in the plant communities which could effect the natural values for which the areas were nominated. Seven potential RNA cells would not be filled. These areas would remain open to off-highway vehicle (OHV) use, mineral entry, and timber harvest and there could be irreversible or irretrievable losses of these values.

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[1] Cells: Cells are artificial constructs to allow for the inventory classification and evaluation of natural areas in Oregon. Cells may contain one or more ecosystem elements.

Under Alternative C, 11 new ACECs would be designated (Bill Creek, Crooks Creek, Flounce Rock, Hole-in-the-Rock, Jenny Creek, Pacific Crest Trail, Pilot Rock, Poverty Flat, Rogue River, Siskiyou Mountain Natural Area, and Sterling Mine Ditch). Five new RNAs (Grayback Glade, Lost Lake, North Fork Silver Creek, Old Baldy, and Scotch Creek) would be designated. Brewer Spruce RNA would be enlarged by 1,384 acres. Three potential RNAs (Holten Creek, Oregon Gulch, and Pipe Fork) would not be designated. Holten Creek would have nine acres that could be impacted through timber harvesting in the 10-year scenario. Thirteen potential ACECs would not be designated but could receive some protection under other land use allocations such as R&R blocks and connectivity corridors. Potential ACEC areas not designated under Alternative C that could be subject to timber harvest are Bobby Creek, Dakubetede, French Flat, Rogue River, and Williams Watershed.

In addition to the 11 ACECs and 5 RNAs designated in Alternative C, Alternative D would designate three more ACECs (Iron Creek, Little Hyatt, and Tin Cup). Ten potential ACECs would not be designated. Those which could be available for potential timber harvest are Bobby Creek, Cedars of Beaver Creek, Dakubetede, Enchanted Forest, French Flat, Rock Creek, and Williams Watershed. Three potential RNAs would not be designated (Holten Creek, Oregon Gulch, and Pipe Fork). In the short term, Oregon Gulch could have 89 acres available for potential timber harvest and Pipe Fork could have 146 acres available. Three potential RNA cells would not be filled.

Under Alternative E, all potential ACECs and RNAs would be designated. Emphasis would be placed upon managing these areas for primary values which the areas were designated. No existing or potential special areas would be adversely effected by resource development activities.

The PRMP would designate all existing and potential RNAs and EEAs. In addition, it would designate 14 additional ACECs (Baker Cypress, Bobby Creek, Crooks Creek, French Flat, Hole-in-the-Rock, Hoxie Creek, Iron Creek, Jenny Creek, Moon Prairie, Pilot Rock, Poverty Flat, Rough and Ready, Sterling Mine Ditch, and Tin Cup). Ten acres of Flounce Rock would be designated as an ACEC known as Baker Cypress. The remaining 495 acres would be designated an EEA and managed for educational purposes.

Under the PRMP, portions of five nondesignated potential ACECs would be protected under other designations. One, the Dakubetede potential ACEC contains the Sterling Mine Ditch ACEC. Two, the Pacific Crest Trail (PCT) would be managed as a special recreation management area and under VRM Class II guidelines. Approximately seven miles of the PCT would pass through an old growth emphasis area (LSR). Three, the Rogue River potential ACEC, with minor exception, would be managed as a Wild and Scenic River or under VRM Class II guidelines. Some "seldom seen" acres in this potential ACEC would be managed under VRM Class IV guidelines. Four, the potential Williams Watershed ACEC contains two RNAs (Pipe Fork and Grayback Glades) that would be designated under the PRMP. These 1,587 acres would protect the values of natural systems and special status species. The remainder would be in a LSR. Five, the Siskiyou Mountain Natural Area potential ACEC would have 2,847 acres designated as the Oregon Gulch and Scotch Creek RNAs and contains portions of the Jenny Creek and Pilot Rock ACECs. In addition, 25,000 acres of this proposed ACEC would be managed as the Cascade/Siskiyou Ecological Emphasis Area. A management plan would be prepared for the Cascade/Siskiyou Ecological Emphasis Area with the objective to protect the primary values of the area and to maintain its biological diversity. Timber harvest would be deferred for up to ten years pending completion of a management plan.

Portions of the above five potential ACECs and eight other potential ACECs would not be designated in the PRMP and would be available for other types of use. This could be an irreversible and irretrievable commitment of resources. The opportunity to protect special natural values in these areas could be lost. (See Appendix 2-SA-2, Draft RMP, for management of areas not designated as special areas.)

Primary values protected or managed for in designated special areas are an indication of the diversity the special areas provide in the planning area. Primary values protected by alternative are displayed in Table 4-SA-1.

Conclusion

Alternatives NA, A, and B designate very few special areas and consequently many primary values would not be represented. Alternatives C, D, E, and the PRMP designate more special areas with all primary values represented under each alternative. All potential RNAs (14) and EEAs (4) would be designated under the PRMP. Seventeen ACECs would be designated to protect primary values.

Table 4-SA-1. Special Area Primary Values Protected Under Each Alternative

Primary Value	NA	A	B	C	D	E[1]	PRMP
Natural systems/processes	0	0	0	5	7	1	10
Natural area to serve as baseline/research	2	0	1	9	9	12	12
Old growth	0	0	0	1	4	1	6
Special status species	4	1	5	11	12	12	12
Botanical	3	1	1	1	2	16	15
Geological	1	1	1	4	4	4	3
Wildlife	0	0	0	4	8	1	7
Fisheries	0	0	0	2	2	3	2
Scenic	1	1	1	4	4	4	3
Historic/Cultural	0	0	0	1	1	2	1

[1] All potential special areas would be designated under Alternative E. More than one primary value is usually found in each potential special area.

Effects on Cultural Resources

Under all alternatives, the processes for protecting cultural resources remain the same as specified in the Natural Historic Preservation Act and accompanying regulations. Inventories would be conducted to locate sites, and those sites that cannot be avoided during ground-disturbing activities would be evaluated. Mitigation measures and appropriate tribal consultation would be undertaken for those sites deemed significant. Despite these processes, some inadvertent loss of cultural resources would occur due to the difficulty of locating cultural materials in the heavily forested parts of the planning area. Nonetheless, the overall effect of the different alternatives on cultural resources varies with the amount of surface-disturbing activity permitted.

Alternatives NA, A, B, and the PRMP emphasize timber harvest and motorized recreation and have a higher potential for adverse effects on cultural resources than do Alternatives C, D, and E, which emphasize reduced timber harvest and motorized recreation.

Slight positive effects would accrue from the information gained from inventory and mitigation work associated with high disturbance alternatives. However, low disturbance alternatives would result in a higher level of positive effects, primarily in the form of the preservation of information.

Protection of riparian management areas (RMAs) could be beneficial to the preservation of cultural resources due to the correlation of cultural resources and water sources. Affirmative measures common to all alternatives, such as interpretation, law enforcement monitoring, and inventory and evaluation would also result in positive effects. However, some adverse effects would occur regardless of which alternative is selected for implementation.

Effects on Visual Resources

Resource development actions that disrupt the land surface, change vegetative patterns, alter species composition, or introduce structures on the landscape normally have adverse effects on visual resources. The severity of the effect depends on many factors, including type of modification, location, number, size and shape of modifications, location and design of roads, amount and treatment of development debris, and visibility of disturbed areas. The existing condition (such as scenic quality) of a viewshed is also a determining factor. Generally, viewsheds that are noticeably altered can be further modified with less adverse visual effect than viewsheds with little or no visible alteration. In some situations, the effects of landscape modifications can be beneficial. Examples are the introduction of vegetative diversity within a monoculture forest setting, thinning of foreground vegetation along roads to create pleasing views, and modifying geometric harvest cutting boundaries into more natural patterns.

Two activities having the greatest short and long term adverse effects on visual resources are timber harvesting and road construction. Mineral development and wildlife/fisheries improvement projects usually have short term localized adverse effects on visual resources. Allocation of lands for development of major rights-of-way (powerlines and pipelines) and telecommunication facilities located in highly visible areas have high long term adverse effects on visual resources. However, no new corridors or communications sites are anticipated under any alternatives. Expansion or replacement of existing facilities could occur (i.e., PP&L 500 KV, Medford to Eugene) where new facilities could have greater adverse effects than the existing facilities.

In each of the alternatives, the visual resource management (VRM) allocations differ from the 1988 VRM inventory management classifications shown on Map 3-11. This is because VRM management allocations of each alternative are designed to fit the overall resource management emphasis of that alternative. An example of possible changes are from Class II to IV or from Class II to I. An alternative that changes VRM inventory classes from IV to II would allocate more restrictive management objectives (i.e., less landscape disturbance) for affected areas and therefore lower adverse effects on visual resources. Changes from Class II to Class IV would have the opposite effect. The long term effect of Class IV management could be to lower scenic quality.

Table 4-VRM-1 and Table S-1 summarize VRM management class acreage changes by alternative.

Under all alternatives, there would be no adverse effects on visual resource conditions on approximately 23,300 acres of VRM Class I land because surface-disturbing activities which modify the visual landscape would be prohibited. Under all acts, the Wild Rogue Wilderness and the Rogue National Wild and Scenic River corridor would be managed as VRM Class I.

Alternatives NA, A, and B would have the greatest adverse effects to visual resources due to their higher levels of timber harvest and road construction and their extensive acreage changes of VRM Class II and Class III lands to VRM Class IV management. Under Alternatives A and B, noticeable adverse effects would occur within national/regional recreational areas and federal/state scenic highway viewsheds in the short term. These changes could adversely affect local tourism initiatives to diversify their economy. These changes would be considered serious adverse effects over the long term.

Under Alternatives B and C, visual resource inventory management classes would not be changed on lands not available for timber management, public domain (PD) lands, or on land within one-quarter mile of state and federal highways and developed recreation sites. However, in some cases it would not be possible to meet VRM Class II and Class III management objectives on these small interspersed parcels that adjoin lands available for timber harvest.

Overall, Alternative C would have moderate beneficial effects on visual resources as timber management would emphasize biological diversity on all BLM-administered land. The highest level of adverse effects would occur in areas where BLM administers less than 50 percent of the lands within a

Table 4-VRM-1. Summary of VRM Allocation Acreage Changes

VRM Class	1988 Inventory	NA	A	B	C	D	E	PRMP
I	23,300	+14,600	0	0	0	0	+53,800	9,000[1]
II	287,000	-294,300	-345,100	-291,800	-175,000	+89,000	+306,200	-274,800
III	319,000	-117,600	-217,400	-141,000	+23,400	-69,800	-137,500	+144,000
IV	248,200	+395,400	+563,500	+432,700	+151,500	-19,200	-222,500	+130,800

[1] Deletion for Wild Rogue Wilderness.
-: Amount of decrease from 1988 inventory
+: Amount of increase from 1988 inventory
0: No change from 1988 inventory
SOURCE: WODDB, Medford VRM Inventory, 1988 (see Table 3-VRM-1).

viewshed in the low retention management area. These areas would be managed under VRM Class IV objectives. However, the low retention biological diversity silvicultural prescription for timber harvest is designed to meet VRM Class III management objectives which would have a slight beneficial effect. Within the high retention management area, it is assumed VRM Class II management objectives would be met most of the time. On land unavailable for timber harvesting (approximately 392,300 acres) and on lands where BLM administers more than 50 percent of the viewshed, visual quality would be maintained.

Alternative D would have beneficial effects on visual resources because lands would be managed as inventoried, except an additional 89,000 acres within rural interface areas (RIAs) would be managed to comply with VRM Class II objectives.

Alternative E would have the greatest beneficial effects on visual resources as it would provide for the least amount of landscape modification. All high scenery quality and high public sensitivity viewing areas (approximately 446,200 acres) would be protected from noticeable disturbance. The condition of areas with moderate- to low-value scenery and/or low sensitivity would also improve in the long term. This is because all VRM Class IV lands (approximately 238,200 acres) would be managed as VRM Class III.

In terms of acres allocated to various VRM classes, the PRMP would be most similar to the NA Alternative, except additional lands would be set aside as special areas (ACECs, RNAs, and EEAs), Late-Successional Reserves, and Riparian Reserves which would provide additional protection to visual resources. While these land use allocations generally have no specific VRM designation, actual management would be similar to or exceed VRM-II standards.

Most high quality scenery and high public sensitivity viewing areas would be protected from noticeable disturbance. The effects of the northern GFMA, which leaves 6 to 8 green trees per acre, would be visually comparable to a clearcut in both the short and long term. The southern GFMA prescribes a mix of silvicultural regimes including even-aged, multiple-aged, thinning, and shelterwood retention. Fragile soils areas (approximately 85,300 acres) would also be managed under this silvicultural prescription. These prescriptions would generally meet VRM Class II management objectives when applied to specific sites. However, in some cases it could only meet VRM Class III objectives.

Conclusion

Under the NA Alternative, the scenic quality on BLM-administered land within the planning area would decline. Alternatives NA, A, and B would have the greatest adverse effects on visual resources. Under the PRMP, overall adverse effects to visual resources would be moderate to low in the short term. Adverse effects to visual resources under Alternatives C, D, and E would be negligible in the short term. Alternatives D and E would provide for the best management of visual resources.

BLM's ability to affect any area's overall scenic quality depends to a large degree on land ownership patterns. In areas where most of the land is under BLM administration, visual resource effects could be better managed. However, in most of the planning area, public lands are intermingled with private lands, usually commercial forestland. Management activities on these lands can dominate the visual landscape regardless of BLM's management activities. Management actions on these private lands is likely to have a greater short and long term adverse effect on scenic quality than changing visual management classes from Class II or Class III to Class IV on BLM-administered land.

Unavoidable adverse effects of each alternative would be the alterations to the characteristic landscape caused by resource development activities. All major resource development projects introduce contrasts within the existing characteristic landscape, some of which result in unavoidable short and long term adverse effects. Some silvicultural practices, road construction, mineral development, and energy corridors would create long term unavoidable alterations on the landscape. Smoke from prescribed burning would create localized short term seasonal effects on visibility. Land allocations to roads, utility corridors, quarries, mines, and communication sites constitute a long term adverse effect on scenic resources.

The allocation of lands currently inventoried for VRM Class II and III management to VRM Class IV management would constitute a long term adverse effect on visual resources. Management of large acreages for VRM Class IV management may not produce a noticeable change of the landscape characteristic in the short term but would result in adverse effects over the long term.

Effects on Wild and Scenic Rivers

River-related values within approximately one-quarter mile of the existing Congressionally-designated Rogue National Wild and Scenic River would not be effected by BLM resource management activities under any alternative. These river values would be protected under all management alternatives.

Interim protective management would be applied to protect outstandingly remarkable values of the 16 river segments determined to be eligible for inclusion as components of the national system but which are not being studied for suitability in the RMP. These 16 segments generally contain little BLM-administered land. Interim protective management would continue pending resolution of the wild and scenic river issue involving these eligible river segments. The following environmental consequences relates solely to the 47 BLM-administered river segments being studied for suitability in the RMP.

To be eligible for inclusion as a component of the National Wild and Scenic Rivers System, a river or river segment must be in a free-flowing condition and possess at least one river-related value determined to be outstandingly remarkable. These two Congressionally-established criteria are used to judge changes in resource conditions, particularly adverse changes. If resource management activities inherent to a specific alternative would alter flow characteristics of a study river segment or degrade the segment's outstandingly remarkable values, the change by the actions allowed would be considered adverse. None of the alternatives include management activities that would adversely effect the free-flowing condition of the 47 study river segments.

Road construction and timber harvesting of forest stands in unroaded portions of any eligible stream corridor with a potential wild classification would be an irreversible or irretrievable commitment of that classification. Any opportunity to manage these river segments as "wild river areas" would be lost with implementation of such activities. Harvest of forest stands that substantially contribute to the outstandingly remarkable values of scenery or recreation constitutes an irreversible or irretrievable commitment of those values, at least for the approximately 200 years it would take to reestablish old growth forest stands.

The analysis presented below and displayed in Table 4-WS-1 relied heavily on the adverse effects to outstandingly remarkable values associated with these activities.

The effects on river-related values from BLM resource management activities would vary by alternative. It is assumed activities effecting outstandingly remarkable values in the short term would have similar effects over the long term. For example, if lands within a study corridor are allocated to timber management, effects from timber harvesting would be the same whether the harvesting occurs in the short or long term. Table 4-WS-1 summarizes probable short and long term changes in the condition of outstandingly remarkable values for each of the 47 study river segments by alternative. The rationale supporting these determinations of condition change is presented in the separate suitability assessment for each study river (see Appendix J). Suitability determinations for each study river segment are displayed in Table 2-19.

Changes to the fish-related outstandingly remarkable values would be negligible or nonexistent for 17 study river segments regardless of alternative because the RMA width for streams containing fish is considered sufficient to protect this outstandingly remarkable values (see Table 4-WS-1). The short and long term effects of probable changes in other outstandingly remarkable values within each river's 1/2-mile-wide study corridor are summarized below.

Under the NA Alternative, interim protective management would be applied to all studied river segments. This would be a positive short term beneficial effect.

Under Alternatives NA, A, and B, most BLM-administered land within the 47 study river segments would be available for a variety of uses including timber management. During the short term, it is probable that some prescribed management activities, primarily timber harvest and road construction, would adversely effect the outstandingly remarkable values for which the study river segments were determined eligible. Under these alternatives, the eligibility status of 30 streams would not be maintained[2]. Timber harvesting and road construction within the one-half-mile-wide corridors would reduce identified outstandingly remarkable values to less than an outstandingly remarkable condition. While the eligibility status of four study river segments (Jenny Creek (Ashland RA), Quartz, Kelsey, and Howard) would be maintained over the short term, timber harvest and associated activities would reduce potential classifications from wild to recreational over the long term. The potential classifications and eligibility status of the remaining 13 streams would be

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[2] Lost Creek (Seg. 2). Alder, Booze, Bronco, Bunker, Copsey, Cowley, Ditch, Meadow, Quail, Russian, Slide, East Fork Whisky, West Fork Whisky, Anna, Ash, Bailey, Centennial Gulch, Hewitt, Jenny, Little Windy, Long Gulch, Missouri, Montgomery, Rum, Wildcat, North Forth Galice, Big Windy, Dulog, and East Fork Big Windy creeks.

Table 4-WS-1. Probable Short Term Changes in Outstanding Remarkable Value Conditions for Study River Segments

Study River Name	Highest Potential Classification	Identified [1] Outstandingly Remarkable Values	Probable Changes by Alternative [2]						
			NA	A	B	C	D	E	PRMP
Ashland Resource Area									
Jenny Creek	Scenic	Fish, wildlife	0	0	0	0	0	0	0
		Historical	0	0	0	0	0	0	0
Lost Creek (Seg. 2)	Wild	Scenic	-	-	-	+	+	+	+
Ninemile Creek	Recreational	Fish	0	0	0	0	0	0	0
Soda Creek	Recreational	Fish	0	0	0	0	0	0	0
Star Gulch Creek	Recreational	Fish	0	0	0	0	0	0	0
Butte Falls Resource Area									
North Fork Big Butte Creek	Recreational	Fish	0	0	0	0	0	0	0
Rock Creek	Recreational	Fish	0	0	0	0	0	0	0
Glendale Resource Area									
Alder Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Booze Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Bronco Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Bunker	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Copsey Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Cowley Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Ditch Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
East Fork Elk Valley Creek	Recreational	Fish	0	0	0	0	0	0	0
East Fork Whiskey Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Kelsey Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
		Fish	0	0	0	0	0	0	0

Table 4-WS-1. Probable Short Term Changes in Outstanding Remarkable Value Conditions for Study River Segments (continued)

Study River Name	Highest Potential Classification	Identified [1] Outstandingly Remarkable Values	Probable Changes by Alternative [2]						
			NA	A	B	C	D	E	PRMP
Meadow Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Mule Creek Arrastra Creek to Headwaters (4.7 miles)	Wild	Scenic	-	-	-	-	-	+	-
		Recreation	-	-	-	-	-	+	-
		Fish	0	0	0	0	0	0	0
Quail Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Russian Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Slide Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Stanley Creek	Recreational	Fish	0	0	0	0	0	0	0
West Fork Whiskey Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Whiskey Creek to East West Forks	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
		Historical	0	0	0	0	0	0	0
Whitehorse Creek	Recreational	Fish	0	0	0	0	0	0	0
Grants Pass Resource Area									
Anna Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Ash Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Bailey Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Big Windy Creek	Wild	Scenic	-	-	-	+	+	+	+
		Recreation	-	-	-	+	+	+	+
Centennial Gulch	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Dulog Creek	Wild	Scenic	-	-	-	+	+	+	+
		Recreation	-	-	-	+	+	+	+
East Fork Big Windy Creek	Wild	Scenic	-	-	-	+	+	+	+
		Recreation	-	-	-	+	+	+	+

Table 4-WS-1. Probable Short Term Changes in Outstanding Remarkable Value Conditions for Study River Segments (continued)

Study River Name	Highest Potential Classification	Identified [1] Outstandingly Remarkable Values	Probable Changes by Alternative [2]						
			NA	A	B	C	D	E	PRMP
Grave Creek	Recreational	Fish	0	0	0	0	0	0	0
Hewitt Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Howard Creek	Wild	Scenic	-	-	-	+	+	+	+
		Recreation	-	-	-	+	+	+	+
		Fish	0	0	0	0	0	0	0
Jenny Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Little Windy Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Long Gulch Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Missouri Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Montgomery Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
North Fork Deer Creek	Recreational	Fish	0	0	0	0	0	0	0
North Fork Galice Creek	Recreational	Scenic	-	-	-	-	+	+	-
		Recreation	-	-	-	-	+	+	-
North Fork Silver Creek	Recreational	Scenic	-	-	-	+	+	+	+
		Recreation	-	-	-	+	+	+	+
		Fish	0	0	0	0	0	0	0
Powell Creek	Recreational	Scenic	-	-	-	-	-	+	-
		Recreation	-	-	-	-	-	+	-
		Fish	0	0	0	0	0	0	0
Quartz Creek	Wild	Scenic	-	-	-	+	+	+	-
		Fish	0	0	0	0	0	0	0
Rum Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-
Wildcat Creek	Wild	Scenic	-	-	-	+	+	+	-
		Recreation	-	-	-	+	+	+	-

[1] Values which made the segment eligible for study.
[2] Probable effect on outstandingly remarkable value.
+: Beneficial
-: Adverse
0: No change

unaffected by management activities because of other protective management prescriptions.

Under Alternative C, management activities associated with timber harvesting and road construction would eliminate the eligibility status of North Fork Galice Creek. The potential classifications and eligibility status of the remaining 46 streams would be unaffected by management activities because of other protective management prescriptions.

Under Alternative D, the potential classifications and eligibility status of the 47 streams would be unaffected by management activities because of other protective management prescriptions. Whiskey Creek would be found suitable for designation as a wild component of the National Wild and Scenic River System (NWSRS).

Under Alternative E, management activities would not effect the eligibility status and highest potential classification of any study river segment as each study segment would be found suitable for designation consistent with its highest potential classification.

Under the PRMP, four stream segments (Big Windy, Dulog, East Fork Big Windy, and Howard creeks) would be recommended as suitable for inclusion in the National Wild and Scenic River System, and their outstandingly remarkable values would be protected. Interim management would be applied to these study segments pending congressional action to protect the outstandingly remarkable values which lead to their being studied. The eligibility status of Alder, Booze, Bronco, Bunker, Copsey, Cowley, Ditch, Meadow, Quail, Russian, Slide, East Fork Whisky, West Fork Whisky, that portion of Whisky Creek to confluence with East and West Forks and outside the designated Rogue corridor, Anna, Ash, Bailey, Centennial Gulch, Hewitt, Jenny (Grants Pass Resource Area), Little Windy, Long Gulch, Missouri, Montgomery, Rum, Wildcat, and North Fork Galice creeks would not be maintained.

Timber harvesting and road construction within these stream segments would reduce the identified outstandingly remarkable values to less than an outstandingly remarkable condition. Anticipated activities within the short term would also reduce the potential classification of Quartz Creek from wild to recreational, but their eligibility would be maintained. The potential classifications and eligibility status of the remaining 15 streams would be unaffected by management activities because of other protective management prescriptions.

Effects on Recreation

People visit BLM-administered land to gain a variety of outdoor recreation experiences. The types of experiences gained depend upon a combination of environmental (developed versus undeveloped landscape), managerial (less versus more restrictions), and social (fewer or more contacts with other people) factors. Under all alternatives, no resource allocations would significantly change the already roaded landscape or the way recreation is managed. In the planning area, the primary variation by alternative is the relative change in proposed recreation facility development to meet or exceed anticipated demand.

Therefore, the primary effect on recreation is the provision of existing or new facilities and trails which have an effect on meeting regional demand for those types of activities (see Table 4-REC-1). Demand for facility and trail oriented recreation is estimated to be approximately 533,800 visits per year by the year 2000 (Hospodarsky, as amended, 1991).

Under Alternatives NA and A, it is estimated only 20 percent of the projected demand for recreation sites, trails, and other land-based recreation use on BLM-administered land would be met in the short term. Estimates range to 30 percent for Alternative B, 60 percent in Alternatives C and D, 100 percent in Alternative E, and approximately 90 percent in the PRMP. Additionally, it is estimated under Alternatives D and E, only 80 percent of projected off-highway vehicle (OHV) demand would be met in the short term. Under the PRMP, the estimated demand being met increases to about 90 percent.

Under all alternatives, all recreational demand for motorized travel, hunting, fishing, boating, other water-related recreation, winter sports, and snowmobiling should be met as almost the entire planning area would be available for these activities. Under all alternatives, dispersed recreation activity on BLM-administered land throughout the planning area would increase as visitor use demands increase. Although levels of use might change from alternative to alternative, the differences are considered minor. BLM-administered land, water, and the existing transportation system, which provides extensive access, would not be used to capacity during the short term (see Table 4-REC-1).

The above analysis has excluded facility development along the Rogue National Wild and Scenic River corridor, which is not being addressed in this plan.

Table 4-REC-1. Anticipated Short Term Capability of BLM-Administered Facilities and Resources to Meet Projected Recreational Demand for 11 Major Use Categories

Recreation Use Category	Projected Demand (in Visits for Year 2000)	Anticipated Capability to Meet Demand						
		NA	A	B	C	D	E	PRMP
Off-highway travel (driving motorcycle, ATV, and 4X4 vehicles)	238,387	yes	yes	yes	yes	no	no	no
Motorized travel (sightseeing, exploring)	436,475	yes	yes	yes	yes	yes	yes	yes
Nonmotorized travel (bicycling, day hiking/ backpacking, horseback riding)	279,033	no	no	no	no	no	yes	no
Camping	260,210	no	no	no	no	no	yes	no
Hunting	154,696	yes	yes	yes	yes	yes	yes	yes
Other land-based use (picnicking, studying nature, viewing wildlife)	498,814	no	no	no	no	no	yes	no
Fishing	249,137	yes	yes	yes	yes	yes	yes	yes
Boating	154,112	yes	yes	yes	yes	yes	yes	yes
Other water-based use (swimming, general waterplay, tubing)	84,800	yes	yes	yes	yes	yes	yes	yes
Winter sports (cross-country skiing, snowshoeing, sledding/snowplay)	46,088	yes	yes	yes	yes	yes	yes	yes
Snowmobiling	1,736	yes	yes	yes	yes	yes	yes	yes

SOURCE: USDI - Bureau of Land Management, Recreation Management Information System. Extrapolated from: Hospodarsky, Denver 1989. The Pacific Northwest Outdoor Recreation Consumption Projection Study: Oregon Project, Final Report. Oregon State University.

Under Alternatives NA, A, B, and C, designations of public lands as open, closed, or limited to OHV use would have minimal adverse effects on OHV use and future demands could be met. This is because most roads would still remain open to motorized traffic (see Table S-1). In addition, the dense stands of brush and forest vegetation tend to limit OHV use within the planning area to roads. Seasonal closures that protect wildlife values and reduce erosional effects could affect an estimated 30 percent (1,500 miles) of the roads, but this is considered a minimal adverse effect. Even under Alternatives D and E, which would limit motorized vehicle use to existing or designated roads, adequate opportunities for public participation in many of the dispersed recreation activities would be provided with no appreciable deterioration in experience quality. The PRMP would also provide adequate opportunities for dispersed OHV use on roads and trails with no appreciable deterioration in experience quality. However, opportunities to meet anticipated demand in the year 2000 would not be met under Alternatives D, E, and the PRMP. This would be somewhat alleviated by providing opportunities for OHV in three areas specifically designated to provide for this type of recreation use. Under the PRMP, the Timber Mountain/Johns Peak, Ferris Gulch, and Quartz Creek would be allocated to motorized OHV use. These designated OHV-use areas would be a beneficial effect for OHV use. In addition, driving for pleasure would be enhanced by designating 8 new back country byways, raising the total to 11, covering 352 miles.

Closing caves used by the Townsend's big-eared bats could have an adverse effect on recreational spelunking. However, it is anticipated the adverse effects would be minor, because the closures could be seasonal and other caves are available in the area for spelunking.

Under Alternative E, recreation sites and trails, which would meet or exceed demand, have been identified. Existing and potential special recreation management areas (SRMAs) would be protected by restricted timber harvest. Under Alternative C, most scenic and sensitive areas would be protected with a timber management emphasis on biological diversity for the planning area. In addition, more lands would be reserved in a state of unroaded, primitive back country to meet demands for these recreation activities. Under Alternatives NA, A, and B, overall effects would be adverse because recreation development would not meet current demand or projected demand for the year 2000, and recreational resource lands providing unroaded, primitive, natural back country activities would be lost at a greater rate from resource development actions.

Recreation facilities on BLM-administered land could also be developed through partnerships and challenge-grants with national/local organizations, businesses, and local communities to provide recreation facilities and trails and operation and maintenance services. Many local partnerships/ volunteers have assisted the district over the years to provide these opportunities. The effects of these actions are beneficial to the recreation program.

Effects on Wilderness

The entire Wild Rogue Wilderness is now managed by the Siskiyou National Forest. This includes the wilderness values on BLM public lands (approximately 8,971 acres). These lands would be managed according to the Siskiyou National Forest Management Plan under all alternatives; wilderness values would be protected.

The Soda Mountain Wilderness Study Area (WSA) (5,867 acres) and the Brewer Spruce Instant Study Area (ISA) (429 acres) would be managed according to BLM's Wilderness Interim Management Policy until Congress acts to designate or not designate these areas as wilderness. Values associated with these areas would be protected until a Congressional decision is made regardless of which alternative is chosen as the approved RMP.

Wildfire could have adverse effects on the areas' wilderness values. To minimize adverse effects of wildfire, the above study areas would receive conditional fire suppression treatment with restrictions on the use of tractors. This level of protection would be provided until specific management plans are prepared.

If not designated for wilderness, the following would apply.

- Under Alternatives NA, A, and B, the Soda Mountain WSA would be available for a variety of uses including timber harvesting. Effects of this allocation would be that the existing roadless area values and associated wilderness values could be lost.

- Under Alternatives C, D, and E, this area would be managed as part of the larger Siskiyou Mountain ACEC, which coincidentally would maintain the area's wilderness characteristics and values.

- Under the PRMP, the western one-half of the Soda Mountain WSA would be managed as part of an LSR, and the eastern one-half would be managed as part of the Cascade/Siskiyou Special Emphasis Area. Management objectives for these areas would maintain ecological complexity and natural conditions. However, these objectives are not designed to preserve wilderness values and they may decline or disappear over the long term.

- Under Alternatives A, the Brewer Spruce ISA would be available for a variety of management uses including timber harvesting. This allocation could result in the loss of the area's natural values and the ability of the area to fill a cell in Oregon's Natural Heritage System. Under Alternatives NA, B, C, D, E, and the PRMP, the Brewer Spruce ISA (429 acres) would be designated as an ACEC/ RNA. This designation would maintain the natural values associated with the area.

Effects on Timber Resources

The sustainable timber production level for any alternative is a result of the set of land use allocations, harvest deferrals and landscape constraints, management restrictions, and silvicultural practices proposed under each alternative. Table 4-I-1 displays the probable sale quantity (PSQ) by alternative. In addition to the displayed harvest levels, it is projected that an additional 10 percent of this volume would be available as other wood. The effects of the alternatives on the timber supply and the results of sensitivity testing are discussed in the text of this section.

Amounts of timber produced may vary as a result of activities for the creation and maintenance of older forest conditions, specific wildlife habitat, or forest health restoration and as a result of processes such as watershed analysis and litigation. Volume that may be produced from activities for the creation and maintenance of older forest conditions, specific wildlife habitat, or forest health restoration is not included in the PSQ.

Effects of Land Use Allocations on Timber Production

Allocations of lands to timber production and other resources are displayed in Table S-1. This section discusses the effects of the allocation of woodlands and of suitable commercial forestland (SCFL) separately.

Allocation of suitable commercial forestlands under the NA Alternative is based on the 1977 timber production capability classification (TPCC) inventory, while other alternatives utilize a different strata of lands identified by the 1988 inventory. The PSQ for the NA Alternative was extrapolated from SIMIX calculations made for the previous decade, while the other alternatives used TRIM-PLUS to estimate PSQ (see Appendix 2-T-5, Draft RMP). Consequently, some comparisons between the NA Alternative and the other alternatives are extrapolations, while other comparisons could not be made.

The overall effect of land use allocations on land available for timber production is shown in Table 4-T-1. For purposes of comparison, the NA Alternative is shown as a percent of the suitable commercial forestlands established by the 1988 TPCC.

Under Alternatives A and B, woodland allocations would result in increases of 3.8 percent and 3.1 percent respectively over the PSQ level, which would result from allocation of the suitable commercial forest acres alone. Under these alternatives, the potential of woodlands to contribute to timber production would be limited primarily by allocations to riparian management areas (RMA) that constitute 4 percent of the total acres under Alternative A, and 5 percent for Alternative B.

Riparian Management Areas and Riparian Reserves

Acre allocations to RMAs and Riparian Reserves (RRs) are shown in Table S-1. The RMAs under Alternatives D, E, and RRs under the PRMP would have a high adverse effect on the availability of land for timber production with 13, 18, and 45 percent respectively of SCFL allocated to RMAs or RRs. Alternative C would have a moderate adverse effect with 7 percent of SCFL allocated to RMAs. Alternatives NA, A, and B would have the least effect with 1 percent, 4 percent, and 5 percent of SCFL allocated to RMAs.

Table 4-T-1. Summary Effects of Allocations on Lands Available for Timber Production

	Percent of Total Forest Acres Available for Timber Production						
	NA	A	B	C	D	E	PRMP
Forestland[1]	70	93	84	60	52	11	29
Suitable Commercial Forestland[2]	80	96	89	72	62	13	34

[1] Includes all lands capable of growing more than 20 cubic feet per acre of commercially valuable conifer species per year.
[2] SCFL totals 558,900.

The RMA allocation used in Alternative A would result in a PSQ reduction of approximately 5 percent. Sensitivity testing (see Appendix 4-I-1, Draft RMP) indicates that RMA allocations used in Alternatives B, C, and D would result in harvest levels of 0.2 percent, 1.6 percent, and 10.3 percent less than what would occur if the alternatives used the RMA allocation utilized in Alternative A. Alternative E and the PRMP were not subject to this sensitivity test, but RMA/Riparian Reserve allocations for these alternatives would have an effect higher than for Alternative D. Under the NA Alternative, the effect of RMA allocations would be an PSQ reduction of less than 1 percent.

Under the PRMP, the prescribed widths of Riparian Reserves are intended to be interim until the completion of watershed analysis. Post watershed analysis RRs for permanently-flowing streams should approximate the boundaries prescribed in the PRMP. However, post-watershed analysis RR boundaries for intermittent streams may differ from those prescribed in the PRMP. Boundary adjustments may increase or decrease the amount of land available for timber production. Future RR boundary changes could potentially effect the PSQ.

Retention or Development of Older Forest

Acres allocated to the retention or development of older forests are shown in Table S-1. Allocations of SCFL to the retention or development of older forests in Alternatives NA and A are relatively minor and would have little effect on PSQ.

Alternative E would have a high adverse effect on the availability of land for timber production with approximately 36 percent of SCFL allocated to the retention of forest stands over 150 years of age. Under Alternative D, allocation of approximately 28 percent of the SCFL to northern spotted owl habitat conservation areas (HCA 1s, 2s, and 4s) would have a moderately high adverse effect. Alternative C would have a moderate adverse effect, with approximately 18 percent allocated to old growth retention and restoration blocks. A sensitivity test indicated this allocation would result in an allowable cut reduction of approximately 17 percent, compared to management of these blocks under a high retention silvicultural system. The PRMP would also have a moderately high adverse effect with 25 percent of SCFL acres allocated to Late-Successional Reserves. Alternative B would have a low adverse effect with approximately 6 percent of SCFL acres allocated to a series of seral diversity blocks.

In addition to Late-Successional Reserves, approximately 7,250 acres of SCFL would be reserved as owl pair sites. Older forest classified as critical habitat and located within Matrix lands if unavailable for timber production would reduce the net operable acres by approximately 59,000. A sensitivity analysis of the effects of excluding designated critical habitat from timber production indicated a PSQ reduction of over 17 million board feet annually (about 30 percent).

Special Management Areas

Those areas allocated to special management, such as special status species habitat (except the northern spotted owl), special areas (ACECs and RNAs), recreation sites, and special habitats, special area allocations would have the greatest effect on the availability of SCFL for timber production. Allocations to special areas would have the greatest adverse effect under Alternative E with 16 percent of the SCFL allocated to special areas. Alternatives C and D would have similar adverse effects to Alternative E with 13 percent of the SCFL allocated to special areas. Special areas within the PRMP would have a low adverse effect. Alternatives NA, A, and B would have very low adverse effects with less than 1 percent of the SCFL allocated to special areas.

Effects of Applegate Adaptive Management Area

Adaptive Management Areas (AMAs) are unique to the PRMP, therefore, no comparison can be made with the other alternatives. Management activities in these areas will be conducted to achieve objectives as described in Chapter 2. For modeling purposes, it was assumed that management of the Applegate Adaptive Management Area would be similar to that of the southern GFMA. However, since the management strategy to meet the objectives and emphasis of the AMA is not prescribed, the PSQ associated with the Applegate AMA is only a projection. The AMA will ultimately have a plan that will include both short term (3 to 5 year) timber sale plan and long term yield projections. These acres are included in the restricted category.

Economically Marginal Lands

Under Alternative E and the PRMP, lands inventoried as economically marginal would not be available for timber management. If these lands were allocated to timber production, the PSQ would increase less than 1 percent. Under the PRMP, lands inventoried as economically marginal would not be planned for timber management under current conditions. If these lands were allocated to timber production, the PSQ would increase less than 1 percent. Salvage from these lands would have no effect on sustainable timber yield.

Roads

Construction of permanent roads, landings, and rock quarries would reduce the total acres of land available to timber production. The amount of land occupied by permanent roads is considered an irreversible commitment of resources and is an unavoidable adverse effect of timber management. The reduction in forestland acreage resulting from road construction would continue until all roads necessary for management are constructed. The length of time and the amount of road to be constructed would be related to the number of acres harvested and their spatial arrangement. Table 4-I-1 displays estimated miles of road construction annually by alternative.

Roads would be constructed across forestlands and lands allocated to other resources. Although Alternatives NA, A, B, C, and D have similar amounts of estimated road construction. Alternatives A and B would have the greatest amounts of land removed from timber production, as they contain the highest percentages of land allocated to timber production. Roads would remove the least amounts of land allocated to timber production in Alternative E and the PRMP.

Designation of eight new Back Country Byways would not impact the PSQ as timber management activities along the byways would be similar to adjacent timber management lands.

Effects of Harvest Deferrals and Landscape Constraints

Under all alternatives except the PRMP, no lands would be deferred from timber harvest or limited in the degree of entry permitted per decade.

Under the PRMP, approximately 9,200 acres of SCFL in high risk watersheds would be deferred from harvest over the next decade. In subsequent decades, harvest levels would be limited to no more than 25 percent of the BLM-administered land in these watersheds per decade. While these deferrals would have a small negative effect on PSQ, the effect would be less than what would occur if these lands were not available at all for harvest in future decades. It is possible that watershed analysis could indicate the need to defer timber harvest from additional watersheds. Until such analyses are complete, the number, size, and locations of additional watersheds that may be deferred is unknown. The possibility of additional watershed timber harvest deferrals and their magnitude is an uncertainty that is not reflected in the PSQ calculation.

Under the PRMP, harvest in approximately 11,100 acres of SCFL in the connectivity area would be permitted but would be limited to no more than about 6 percent of the available acres per decade. This harvest limitation would have a minor negative effect on timber production.

Effects of Restrictions on Timber Management Practices

Restrictions on timber management practices to meet other resource objectives would have two important effects, reduction in timber production and increases in the cost of timber management. Table 4-T-2 shows which restrictions are felt to substantially effect timber production levels or costs.

Management restrictions incorporated in the designs of Alternatives C, D, and the PRMP would have the largest negative per acre effect on timber production and the cost of timber management. The systems used in Alternatives NA, A, B, and E would have the least effect. Some management restrictions limit silvicultural treatments that would result in lower volume growth and sustainable harvest levels below the biological capability of the site. Increased costs are associated with restrictions on management practices and operational complexity.

The alternatives would vary substantially in the cost per thousand board feet of timber produced. In addition to the costs of mitigation through prescription complexity, volume per acre harvested would change substantially between alternatives and would result in differences in costs of timber sale preparation and administration. It is estimated that the combination of overhead costs, silvicultural costs, and timber management costs could result in the highest production costs for Alternatives C and E and the lowest for Alternatives NA, A, and B. The PRMP and Alternative D would have an intermediate production cost level.

Table 4-T-2. Summary Effects of Selected Restrictions on the Timber Resource

Type of Restriction	NA	A	B	C	D	E	PRMP
VRM Class II management	P,C[1]		P,C		P,C	P,C	P,C
Management for biological diversity				P,C			P,C
Habitat connectivity				P,C	P,C		P,C
Rural interface			C		P,C	P,C	C
Snag retention and other mitigations for wildlife species				P,C	P,C	P	P,C
Fragile soils						P	P,C
Soils and watershed protection	C	C	C	C	C	C	P,C
Intermittent second order stream protection					P	P	P,C

[1] P: Reduction in timber production.
C: Increased cost of timber management.

Protection Buffers, Survey and Manage Requirements, and Protection of Bat Roost Sites

The Management Action/Direction for the PRMP, as described in Chapter 2, identifies species for which protection buffers are to be provided; SEIS Special Attention Species that require additional survey strategies; and specifies additional protection for caves, mines, and abandoned wooden bridges and buildings that are used as roost sites for bats. As surveys are conducted, the number of identified species and/or populations could result in additional areas removed from timber production. The total extent of species, sites, and effect on timber production is unknown. The potential impact on timber production could be significant. Also, additional costs incurred for inventories could be significant.

Effects of Silvicultural Systems and Silvicultural Practices

Silvicultural systems and practices would effect long term yield, reforestation success, long term site productivity, wood quality, and risk of timber productivity loss to disease and insects. Tables S-1 and 4-I-1 display estimated average annual acres of practices by alternative. Some practices are anticipated to occur regardless of land use allocation. Precommercial thinning/release and fertilization estimates given for the PRMP are an example of this. The acreages (7,800 and 5,700 respectively) given are potential acres across all allocations. Practices would be designed to meet the objectives of the allocation and would be based on the appropriate watershed analysis. Appendix 2-T-1, Draft RMP describes silvicultural systems and practices for Alternatives A-E. Appendix K describes silvicultural systems and practices in the PRMP.

Increases in timber harvest associated with growth-enhancing practices are considerably less than the long term yield effects. This is because sufficient surplus merchantable volume is not available to accelerate harvests in the decades prior to these higher volume stands reaching minimum harvest age (for a discussion of the allowable cut effect, see Appendix 2-T-5, Draft RMP). Alternatives NA, A, and B would receive the largest PSQ increase from intensive silvicultural practices.

Sensitivity tests were conducted to examine the effects of silvicultural practices on PSQ. Precommercial thinning, release, fertilization, and genetics combined account for 8 percent of the PSQ for the PRMP. Of these practices, genetic tree improvement and fertilization have the least effect and precommercial thinning and release have the largest effect.

The effects of growth-enhancing practices on PSQ vary among the alternatives with the effects being somewhat greater for the PRMP than for Alternatives C, D, and E (see Appendix 2-T-7, Draft RMP).

An increase in the amount of land inventoried as reforestable in the 1988 TPCC over 1977 is contained in the difference in available harvest acres between the NA Alternative and Alternatives A and B. Reforestation success would not be expected to differ between the NA Alternative and Alternatives A and B despite this increase. However, under Alternatives A and B, the high level of harvest on lower elevation lands would require more intensive silvicultural design and treatments as well as greater operational costs than for the other alternatives.

An improvement in reforestation results over the NA Alternative for all other alternatives would occur as a result of the shift to shelterwood retention systems for frost-prone environments. For all alternatives other than the NA Alternative, a greater reliance on the removal of overstory trees and the release of existing understory conifers would reduce the need for reforestation investments.

Alternative C and the PRMP would likely show an improvement in reforestation success over the NA, A, and B because of greater reliance on ecosystem-based approaches. These approaches would result in lower levels of undesired herbaceous, shrub, and hardwood competition and would rely to a greater extent on natural regeneration. A higher level of uncertainty exists, however, for the partial cut prescriptions within Alternatives C, D, E, and the PRMP because of the lack of designed research on these prescriptions.

All SCFL proposed for timber production under any alternative is capable of being reforested within five years of harvest (see Appendix 4-I-1, Draft RMP). Under all alternatives, it is assumed that harvested areas will usually be reforested within one growing season after site preparation, with an adequate number of seedlings of desired tree species. Reforestation estimates do not project full stocking to target levels on all harvested acres but assume that high levels of reforestation success will continue.

Experimental harvests proposed for woodlands under Alternatives A and B would be conducted to determine their reforestability under a variety of silvicultural approaches. While the results of such research is uncertain, observations from the 1987 fires and other data indicate these lands would regenerate using silvicultural approaches similar to those proposed for Alternative C and the southern GFMA of the PRMP. However, site preparation and vegetation-management treatments would be required. Harvest of woodlands would result in an increase in the PSQ of 9 mmbf in Alternative A and an increase of 6.5 mmbf in Alternative B.

Reforestation results for stand conversion units under Alternatives A and B would be expected to be similar to those achieved in reforesting conifer harvest units but a higher level of vegetation management would be required. Stand conversion would be difficult without the use of herbicides. Regeneration of hardwoods on lands available for hardwoods timber management under Alternatives A, C, and the PRMP would occur promptly from natural seedlings and sprouts.

Some silvicultural systems have the potential to negatively effect long term site productivity and long term timber yields (Perry and Maghembe 1989), however, research has not progressed to a point where quantification of effects is possible. Possible risks to long term timber yields are:

- Under Alternatives NA, A, and B, shorter rotations could lead to a more rapid depletion of nitrogen in forest soils.
- Alternatives NA, A, B, D, and E could have negative effects on long term sustainability because their silvicultural systems reduce biological diversity (see Biological Diversity). Studies indicate that mycorrhizal fungi and nitrogen fixing soil organisms are associated with the presence of certain hardwood species (Borchers and Perry 1990; Amaranthus and Perry 1990). However, while the NA Alternative does not provide for retention of hardwoods in managed stands, hardwoods have survived in the past under such prescriptions.
- Simplification of ecosystem processes associated with repeated cycles of intensive management under Alternatives NA, A, and B could result in less resistance to insect pests and pathogens and less ability to adapt to changing environmental conditions such as a potential long term climate change or increased levels of air pollution (Franklin et al. 1989).

Evaluation of these risks indicate that ecosystem-based silvicultural systems such as those used in Alternatives C and the PRMP, which involve longer rotations; retention of higher amounts of species and structural diversity; and the incorporation of ecosystem processes within the silvicultural system, pose the least threat for loss of future yields. Systems used in Alternatives NA, A, B, D, and E pose the largest threat.

Silvicultural systems and rotation lengths have the potential to affect future wood quality and stumpage values (see Wood Quality Appendix BB). Wood quality would be higher under the longer rotations proposed for the PRMP and Alternative C than the other alternatives. Long term stumpage value would be highest for the northern GFMA of the PRMP because of a combination of wood quality, logging cost, and piece size. Partial cut silvicultural regimes planned under Alternatives C, D, and the PRMP carry some risk of decreased wood quality in the long term because of logging damage to reserved trees and introduction of or increases in tree disease.

It is assumed pruning would be conducted under all alternatives, other than the NA Alternative, and would contribute substantially to wood value. The practice would be most appropriate in Alternative C because of the effect of thinning on crown length and limb retention.

Silvicultural systems could influence the risk of insect and disease in managed stands. Timing of thinning treatments, species selection, and other practices common to all alternatives reduce the risk of black stain and other root diseases. The risks to which diseases threaten individual species such as Port-Orford cedar are described in the Vegetation section. Other risks include:

- Partial harvest regimes such as shelterwood retention regimes in Alternatives A, B, and E and systems used in Alternatives C, D, and the PRMP have a higher potential to spread mistletoe and other diseases to new conifer stands.
- Thinning and partial cutting under all alternatives, particularly in white fir stands, can result in damage to tops, crowns, bark, and roots of residual trees, reducing wood quality, and increasing the risk of volume loss to insects and disease.
- Silvicultural systems that enter stands frequently such as the southern prescription in the PRMP and the high retention prescription in Alternative C tend to result in the highest amount of stem and root damage and the introduction of disease into stands.

Effects of Retaining Stand Structure

Under Alternatives C, D, E, and the PRMP, various levels of live trees and/or snags would be retained within harvest areas. In most cases, there would be no planned harvest of these trees, as these trees would provide a source of future snags and/or elements of structural diversity.

When merchantable trees and downed material are reserved within harvest areas, there would be a reduction in yield to account for volume not being removed. Where overstories were retained, there could be an additional reduction in growth of the next stand. In general, growth reductions due to an overstory would depend upon how retained trees were distributed; the size of the retained trees; and the aspect, size, and shape of the harvest unit.

Retained trees have the potential to transmit both desired and undesired genetic traits to subsequent stands (see also Appendix L). Retained structures do contribute to the maintenance of biological diversity.

Effects of Mortality Salvage and Sanitation Salvage

Mortality salvage is designed to recover mortality volume that would otherwise be lost to decay. Sanitation salvage also removes high risk trees. Because salvage is essentially a holding action that does not benefit long term stand growth, additional silvicultural treatments including thinning, fertilization, and regeneration harvesting would be planned under all alternatives in areas subject to salvage. Salvage volume would be substituted for regular green volume and would have no effect on sustainable timber yield. Sanitation salvage, density management, and prescribed burning treatments proposed under Alternative C and the PRMP could result in lower levels of salvage harvests.

The manner in which salvage operations are conducted could affect subsequent silvicultural treatments and systems.

Effects of Land Exchanges

Under all alternatives, efforts would be made to negotiate land exchanges to permit better and more efficient management of BLM-administered land. The PSQ could be effected if land exchanges result in changes in standing timber volumes, acres, age classes, or site conditions. Under Alternatives A and B, exchanges would benefit timber production. Under Alternatives D and E, timber production would probably not increase as a result of exchanges. Under Alternative C and the PRMP, exchanges would benefit a number of resources including timber production. Effects cannot be quantified but are anticipated to be small.

Effects of Mineral Development

Mineral development generally has little adverse effect on the timber resource. Mining activities usually occur in areas not suitable for timber production or in riparian areas where timber practices are already limited. However, development of mineral resources could potentially damage research sites.

Effects of Special Forest Products

Hardwood availability for firewood and other uses would be greatest under Alternatives A and B. Approximately four times the amount of the NA Alternative would be produced. Implementation of Alternative A would result in over 26 million cubic feet of hardwood being produced. Alternative B would result in over 24 million cubic feet being produced. Alternatives C, D, and E would produce the least amounts with Alternative E producing less than 3 percent, the amount produced under the NA Alternative. The PRMP would produce approximately 2.1 million cubic feet of hardwood. Table 2-13 displays hardwood produced by alternative.

Effects of Timber Supply

An analysis of the timber supply for the Medford District has been conducted by the Pacific Northwest Research Station (USDA Forest Service). The study modeled the timber supply from each ownership category in western Oregon. Timber supply from BLM in the Medford District under each alternative was then included, and overall economic timber supply for 1993-2000 was estimated (see Appendix T). In this process the private timber supply was adjusted to account for price changes attributable to the different levels of BLM timber supply by alternative. Then a similar process was followed to estimate the outlook for the 2001-2010 period. The results are displayed in Table 4-T-A. Because the model used has not been validated, its predictive capability is uncertain. However, it is useful for comparison of alternatives.

Compared to the 1984-88 baseline period, total timber harvest from all ownership categories in the planning area would decline under all alternatives. The change in the timber harvest would range from a 12 percent decrease in Alternative A to a 49 percent decrease in Alternative E.

The timber supply analysis estimated the amount of timber which would be harvested in the district from all sources from 2001 to 2010 using the same assumptions as for the previous period. Total timber harvest would decrease relative to both the 1993-2000 period and the baseline. This would be due to decreasing harvests from private lands.

Because a portion of the raw logs are harvested in but processed outside of the planning area, changes in available supply would also affect areas outside of the planning area, but to a lesser degree. Both inflows and outflows of logs affect the amount of wood actually processed in the planning area. Estimates of the amount of wood processed are shown in Table 4-T-B. Overseas log exports are not excluded. Differences between the amounts processed under the alternatives may be attributed to the alternatives. The wood processing sector would consume less wood under all alternatives than during the 1984-88 baseline period.

The cumulative effects of the alternatives are shown in Table 4-T-A. This table shows projected timber harvests in western Oregon based on the assumption that each BLM district adopts the same alternative. The table does not include harvests in Klamath County.

Compared to the 1984-88 baseline, BLM harvests would range from a 5 percent decrease in the NA Alternative to a 75 percent decrease in the PRMP. Total harvests in western Oregon would decline under all alternatives, principally due to decreases in harvests on federal lands. Total harvest would also decrease in all of the alternatives in the 2001-2010 time period, though they would be greater than harvests during the 1993-2000 time period.

Timber processed in western Oregon during 1993-2000 would decrease under all alternatives. Log exports are not excluded from this total.

Table 4-T-A

	1984-88	Alternative						
Supplier[1]	**Baseline**	**NA**	**A**	**B**	**C**	**D**	**E**	**PRMP**
Medford District Timber Harvest (1993-2000) - Millions of Cubic Feet (MMCF) per Year								
BLM[2]	38	36	49	44	11	13	5	10
USFS[3]	37	6	6	6	6	6	6	6
Private (industrial and nonindustrial)	36	43	43	43	44	44	45	45
Other public	1	1	1	1	1	1	1	1
Total	112	86	99	94	62	64	57	62
Medford District Timber Harvest (2001-2010) - Millions of Cubic Feet (MMCF) per Year								
Total	112	81	94	90	57	59	52	56
Western Oregon Timber Harvest (1993-2000) - Millions of Cubic Feet (MMCF) per Year[4]								
BLM	199	187	250	224	67	74	56	35
USFS[3]	376	60	60	60	60	60	60	60
Private (industrial and nonindustrial)	603	618	610	614	634	634	638	640
Other public	62	62	64	64	64	64	64	64
Total	1240	927	984	962	825	832	818	799
Western Oregon Timber Harvest (2001-2010) - Millions of Cubic Feet (MMCF) per Year								
Total	1240	1068	1124	1102	959	964	947	928

[1] Non-BLM supply partitioned on county boundaries to approximate BLM District.
[2] Baseline data from BLM Facts, USDI-BLM. Converted from board feet using a factor of 6.2 bd/cubic ft. Includes woodland harvest.
[3] Assumes implementation of the President's Forest Plan.
[4] Totals do not include Klamath Falls Resource Area.
SOURCE: Non-BLM harvest projections from Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland, OR. 1992. (Revised 1994.)

Table 4-T-B

	1984-88	Alternative						
Supplier[1]	**Baseline**	**NA**	**A**	**B**	**C**	**D**	**E**	**PRMP**
Medford District Timber Processed (1993-2000) - Millions of Cubic Feet (MMCF) per Year								
Total	130	107	116	113	88	90	84	87
Western Oregon Timber Processed (1993-2000) - Millions of Cubic Feet (MMCF) per Year								
Total	1294	1115	1170	1148	1008	1014	997	979

[1] Non-BLM supply partitioned on county boundaries to approximate BLM District.
NOTE: (1) Timber processed from all sources was partitioned on county boundaries to approximate the BLM District.
(2) This analysis accounts for historic patterns of log flows across county boundaries.
(3) Assumes all BLM districts have implemented the same alternative.
(4) Includes logs exported overseas.
SOURCE: Timber Supply Analysis for BLM Planning, USDA-USFS, PNW Research Station, Portland OR, 1992. (revised 1994)

Conclusions

The level of PSQ would be highest under Alternative A and lowest under Alternative E.

The PSQ is projected at sustainable levels for all alternatives so no differences exist in short and long term timber harvest levels. However, some risk exists for the sustainability of site productivity in the long term under Alternatives NA, A, B, D, and E. This could affect timber production in the future. Research data is not sufficient to permit quantification of this risk. Alternatives C and the PRMP use silvicultural systems that would reduce the risk of ecosystem productivity loss in the long term.

The largest effect on timber production PSQ would result from allocations of land as available or not available for timber production. Across the range of alternatives, allocations to RMAs, Riparian Reserves, older forests, and to habitat for northern spotted owls and other late-successional and old growth associated species would have the largest negative effect on PSQ, most noticeably in Alternatives D, E, and the PRMP. The next largest effect would result from management restrictions and from the use of silvicultural systems which result in stand growth and harvest below the biological capability of the forest site. These systems have their largest negative effect in Alternatives C and D but also restrict harvest levels in the PRMP.

Deferrals from timber management have a relatively minor effect on timber production under the PRMP. There is potential however, for effects on timber production from landscape constraints.

Growth enhancing practices including precommercial thinning, release, fertilization, and genetics have a comparatively minor positive effect on timber harvest levels. For the PRMP, they account for 8 percent of PSQ.

Allocations under all alternatives would also affect the cost of timber production. Highest production costs would result under Alternatives C and E. Lowest production costs would result under Alternatives NA, A, and B.

With the exception of variation in rotation length, the alternatives do not have major effects on wood quality. Alternative C, because of low stand densities, could have a detrimental effect on wood quality if pruning were not used.

While all alternatives are designed to assure a high level of reforestation success, Alternatives A and B would result in an increase in reforestation and operational costs required for dry, low elevation sites.

The allocation of sites which were economically marginal for timber production had a very minor effect on PSQ.

Compared to the 1984-1988 baseline period, total timber supply from all ownerships within the Medford District would decline under all other alternatives. The PRMP would result in a timber supply, which is about 55 percent of the baseline period.

Effects on Exploration and Development of Energy and Mineral Resources

The effects of the alternatives on mineral exploration and development are reflected in the predicted amount of mineral development activity anticipated as well as the constraints under each alternative. It is not anticipated the level of mineral exploration would vary much from alternative to alternative. The level of exploration and development anticipated to occur during the life of the plan is described in Appendix 4-EM-1, Draft RMP, for leasable, locatable, and salable minerals.

The allocations and management prescriptions of the alternatives would affect the availability of land for exploration and development of energy and mineral resources by imposing operating constraints on leasable, locatable, and salable mineral activity. The severity of constraints relate to two factors. First, the mineral potential of the land under consideration which remains the same under all alternatives. Second, the restriction on the degree of access to the land under consideration which varies by alternative. Depending upon the mineral type under consideration, restrictions on access are usually referred to as closed, open with substantial restrictions, or open with standard restrictions. Closing areas with high mineral potential would have the highest adverse effect, while closing or substantially restricting access to areas with low potential could have no or very little adverse effect. Substantially restricting access to any mineral resources could increase costs to the point that some operators would be excluded (see Tables 4-EM-1, 4-EM-2, and 4-EM-3, Draft RMP).

Alternatives NA and A make the most acres of land available to mineral exploration and development while Alternatives D and E make the least lands available for mineral location.

Under all alternatives, the anticipated effects to exploration and development of leasable and salable minerals is considered minor. Sufficient amounts of gravel would be made available for adequate road construction and maintenance without any major increase in cost.

Low to moderate adverse effects to exploration and development of locatable minerals would occur in Alternatives E and the PRMP. The effect could accrue to local operators, primarily in the form of increased cost but would have no effect on regional or national supply of minerals.

An irreversible and irretrievable commitment of all mineral resources would be the amounts of mineral commodities actually removed from public lands through development.

Effects of the Alternatives on Special Forest Products

The alternatives would affect the availability of special forest products (SFPs) primarily in two ways. First, the alternatives would affect the availability of SFPs by the degree to which they permit SFP harvest to occur. Acres closed to harvest or having seasonal restrictions could include ACECs, RNAs, or any of the categories listed in the Land Use Allocation section of Chapter 2, Special Forest Products. Alternatives NA, A, and B would provide the largest number of acres open/unrestricted for SFP harvest. Alternatives C, D, and E would have the fewest number of acres open/unrestricted. The PRMP would have a median number of acres available.

Second, the alternatives would affect the availability of SFPs by their objectives and silvicultural systems chosen to meet those objectives, especially timber management and ecosystem health objectives. In general, SFPs that are shade intolerant would be favored under Alternatives NA, A, and B. Special forest products that are shade tolerant would be favored under Alternatives C, D, E, and the PRMP. Likewise, SFPs adapted to younger forests would be favored under Alternatives NA, A, and B. SFPs that are more adapted to older forests or forests containing older components would be favored under Alternatives C, D, E, and the PRMP. Access to harvest sites is also a factor in SFP availability. Alternatives A, B, and D contain the greatest number of miles of proposed road construction; Alternative E and the PRMP contain the least. Table 4-SFP-1 displays the projected effect of the alternatives on the availability of special forest products.

Effects on Socioeconomic Conditions

Introduction

Each alternative analyzed in this Final RMP/EIS proposes varying management prescriptions that would alter the production of commodity outputs and other natural resource values associated with BLM-administered lands. Alternatives A through E have been carried forward from the Draft RMP/EIS and re-analyzed within the context of changed U.S.Forest Service (USFS) management direction specified in the SEIS ROD. While the alternatives only represent actions which could occur on BLM-managed lands, many analytical components of the plan consider the relationship between BLM-administered lands and other landowners, both private and other federal. The economic analysis has drawn heavily upon the analyses conducted by the FEMAT and the FSEIS and its ROD to determine future actions likely on Forest Service lands and to enhance the discussion of cumulative impacts.

No estimates have been made of the economic contributions to local personal income and employment that could be made by any potential development in the area. The timing, duration and degree of such development is speculative and cannot be estimated at reasonably accurate levels given current information. Potential mineral, energy, communication and hydroelectric developments have not been analyzed.

Impacts to Resource Uses

The availability of commodities, natural resources, and opportunities would change by alternative. Commodity uses generate measurable economic activity, both within and beyond the district. These activities include timber production and harvest, mining, recreation, special forest products, and fisheries production.

Table 4-SFP-1. Effects of the Alternatives on the Availability of Individual Harvested Special Forest Products

Specific Product	NA	A	B	C	D	E	PRMP
Products derived from conifers	+	+	+	+	-	-	+
Products derived from hardwoods	+	+	+	0	-	-	+
Christmas trees	+	+	+	+	-	-	+
Boughs	+	+	+	+	-	-	+
Transplants	+	+	+	+	-	-	+
Cones	-	-	-	+	+	-	+
Burls	+	+	+	+	-	-	-
Cascara bark	-	-	-	0	0	0	0
Mushrooms	-	-	-	+	+	0	+
Herbs	*	*	*	*	*	*	*
Moss	+	+	+	+	-	-	-
Huckleberry brush	-	-	0	+	+	-	+
Ferns	*	*	*	*	*	*	*
Beargrass	+	+	+	+	-	-	+
Greenery	*	*	*	*	*	*	*

+: Increase
0: No change
-: Decrease
*: Unknown or species dependant

Natural resources, as well as their associated uses and opportunities, have values that are important but do not generate measurable economic activity within markets. These values are demonstrated by people who express desire for these resources or opportunities on public lands. These non-market values include: scenic areas, water quality, recreation use (in addition to related expenditures), subsistence and cultural hunting and gathering, nature study, and historic and prehistoric sites and resources.

Timber

Timber markets within the Northwest region have undergone significant changes since the 1984-1988 baseline period. Two forces particularly relevant to federal timber supply and price are the curtailment of federal timber sales due to court injunction and the development and adoption of Alternative 9 from the SEIS by the U.S. Forest Service and the Bureau of Land Management. The curtailment of federal timber sales within the range of the northern spotted owl resulted in reliance on sales remaining under contract. This volume is now exhausted on both Forest Service and Bureau of Land Management lands. In April 1994, the Forest Service and Bureau of Land Management adopted new standards and guidelines for resource management with the Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl. This decision resulted in estimation of timber harvest levels significantly lower than those identified in the Forest Service's Forest Plans and BLM's existing Draft RMP/EISs in western Oregon. A net result of these changes has been a reduction of federal timber sales which has resulted in increased demand for raw materials from other sources and increased prices. Regional, national and international markets have been adjusting to accommodate the changed timber supply.

Future timber price assumptions are required to conduct portions of the analysis relating to employment, income, and county revenues. For a complete description of the price estimation process, consult the Draft RMP/EIS Appendix, Timber Supply Analysis for BLM Planning. Briefly, these prices were derived as follows:

- The Timber Assessment Market Model (TAMM)—a national model that examines 11 supply regions and 5 demand regions—was used to capture the interaction of national supply and demand and the changing federal timber supply in the Pacific Northwest's westside region. Given a set of externally-specified economic or policy conditions, TAMM derives the spatial equilibrium for supply and demand for all regions. Using this data, 50-year projections of consumption, production, and prices are calculated. The estimated regional equilibrium prices represent the region's National Forest Cut Price which is commonly used as a proxy for the stumpage price received by all owners. Northwest harvest levels for federal ownerships were externally specified to estimate prices for each alternative. The USFS harvests were equated to harvest levels appearing in the FSEIS, and BLM harvests were varied by alternative. Harvest response by other timber resource owners was based on studies done by the USDA Forest Service Pacific Northwest Research Station. Alternatives NA, A, C, and the Proposed RMP were analyzed, while Alternatives B, D, and E were estimated by interpolation. A regional equilibrium price for the 1993-2000 period was provided for each alternative. The prices were expressed in 1967 dollars. Prices were indexed to the No Action Alternative, then scaled based on actual BLM bid prices for the 1984-1988 baseline period. The resultant price estimates were used in subsequent analyses of county revenues, personal income, and employment.

In general, the price variation among alternatives was minimal. The most significant change was between the baseline period and the 1993-2000 period. The price projection analysis may be used to conclude that multiple factors have combined to cause significant price changes since the baseline period. Future variations in BLM timber harvest, when examined alone, would have only marginal impacts on stumpage prices.

Timber market structures are also undergoing change. Alternatives C, D, E, and the PRMP, which reduce BLM timber harvest below historic levels, would have local, national and global impacts from reduced demand for wood products, use of substitute materials, and substitute supply sources. This timber supply analysis concludes that reductions in BLM harvest from historical levels, combined with reduced USFS harvests, will result in an increase in timber supplied from private lands. The net effect of the lower federal harvest levels, however, will be an overall reduction in timber supplies from western Oregon (USDA, PNW Research Station, 1992).

Analyses using the CINTRAFOR Global Trade Model indicate that reduced timber supply in the Pacific Northwest would be offset by a combination of reduced demand for wood products and additional supplies from other areas in the United States and other wood-producing countries of the global economy (Perez-Garcia 1991). Increased use of substitute or recycled materials, including plastics, aluminum, steel, and cement, would result in reduced demand for wood products. Use of these and other materials, instead of wood products, for similar uses in residential construction required more energy (as measured in oil equivalent BTUs) to produce and deliver (Koch 1991).

Use of substitute building materials and alternative timber resources has raised concerns about the shifting of environmental impacts. Issues that have been studied include the increased use of fossil fuels, CO_2 emissions, environmental impacts of increased mining and quarrying, and supply of wood products from less productive or less efficient producers. Questions have been raised about the incremental impacts of local, regional, and national environmental policy choices on the global economy and environment (Lippke 1991; Schallau and Goetzl 1992).

The rates at which reduced demand, substitute materials, and alternative supply sources will affect these markets are unknown. However, each replacement source can be expected to have associated economic and environmental impacts, often in other regions of the United States and the world.

Forest Production Activities

The structure of the forestry services sector will likely change under adoption of the SEIS ROD as management emphasis shifts from timber production to ecosystem management. As fewer acres are subject to harvest, there will be a decrease in post-harvest reforestation, stand maintenance, and protection needs. Workers in these forest production activities, who are predominantly Hispanic, will likely have many of the skills needed to conduct the additional forest treatments, inventory, monitoring and restoration activities envisioned in the forest management field described in the FSEIS. Additional employment of 6,000 forestry services workers within the range of the northern spotted owl has been estimated (FSEIS 1994). Many of these forestry services jobs, however, are low paying and cannot replace the wages associated with higher paying jobs associated with logging and millwork (Richardson 1993).

Recreation

Each alternative in the Medford District identifies management actions that favor certain types of recreation or constrain development of recreation sites and facilities. Alternatives NA, A, B, C, D, and the PRMP would have unmet demands for nonmotorized travel, camping, and other land-based uses on BLM-managed lands. These constraints are due to limitations these alternatives place on the development of trails, picnic areas, campsites and other facilities, and anticipated funding. Demand for off-highway motorized travel would not be met under Alternatives D, E, and the PRMP due to road closures and off-highway vehicle (OHV) closures. These constraints would change the amount of recreation-dependent personal income and employment attributable to BLM-administered lands in the Medford District. Substitution of recreation opportunities associated with other ownerships and areas within the Pacific Northwest is expected to satisfy all demand for recreation activities.

Special Forest Products

Demand for all special forest products (SFPs) will be met under Alternatives NA, A, and B. Failure to meet demand for fuelwood under Alternatives C, D, E, and the PRMP will impact federal permit receipts. There will be reduced self-sufficiency of some individuals who will be forced to purchase fuelwood at significant additional expense. Demand for all other identified SFPs is expected to be met under these alternatives.

Native Americans and non-native settlers have collected forest products for personal use for many years. Commercial collection has expanded as more products are marketed. Collectors from outside the region sometimes compete with local collectors, which generates conflict (Richardson 1993). Recent Asian and Hispanic immigrants have been identified as specific cultural groups entering the region specifically to collect SFPs. Anecdotal evidence suggests that unemployed wood products workers are also participating in commercial collection (Richardson 1993). Permitted collection of SFPs would be encouraged under all alternatives and may enhance local economies.

Impacts to Personal Income and Employment

The BLMPACT model was used to analyze the employment and income associated with the use of timber, provision of recreation, and forest management within the Medford District. Table 4-SE-1 provides a summary of measurable outputs under each alternative in the Medford District. These values represent only values associated with BLM management actions under each alternative. The values were used to estimate dependent personal income and employment. Table 4-SE-2 displays the varying levels of income and employment by sector associated with each alternative. Display of these impacts was changed from the Draft RMP/EIS in response to public comments. Impacts are now displayed by economic sector; employment and personal income associated with each resource commodity or activity is not shown. As discussed previously, many nonmarket natural resource values were not included in the impact analyses.

Under all alternatives, reaching full implementation would take several years of increasing activities. This could prevent fully reaching to employment and income levels shown here for several years. The employment and income estimates for the PRMP do not include the effects of restoration activities or the processing of wood removed from reserves as part of density management.

Cumulative Impacts to Personal Income and Employment

A cumulative analysis was conducted to examine the effect of BLM management in all western Oregon districts on the western Oregon region. The individual alternatives from all six BLM districts in western Oregon were combined. The BLMPACT model was then used to estimate dependent personal income and employment. The analysis methodology

Table 4-SE-1. Summary of Measurable Annual Outputs by Alternative in the Medford District

	Base	NA	A	B	C	D	E	PRMP
Timber Harvest(mmcf)	37.50	35.58	48.60	44.35	10.67	12.93	5.18	9.70
Non-resident recreation Use[1]								
Fishing (Angler Days)	24.700	32,500	32,500	32,500	32,500	32,500	32,500	32,500
Hunting (Hunter Days)	11,600	13,580	13,580	13,580	13,580	13,580	13,580	13,580
Non-consumptive (User Days)	245,800	302,210	302,210	320,400	374,970	368,280	441,050	408,010
Fisheries Products[2]								
Commercial (M/lbs. landed)	580,185	580,185	580,185	580,185	580,185	580,185	580,185	580,185
Inland sport (Days)	95,234	95,234	95,234	95,234	95,234	95,234	95,234	95,234
Ocean Sport (Days)	8,341	8,341	8,341	8,341	8,341	8,341	8,341	8,341
Timber Management Activity ($MM)	N/A	4.895	6.719	6.450	6.025	5.177	1.836	2.719

[1] Hospodarsky 1989. Pacific Northwest Outdoor Recreation Consumption Projection Study: Oregon Project Final Report. Eixenburger, Don. Oregon State Parks. Personal Communications. July 1991 and December 1991.
[2] Carter, C. Oregon Department of Fish and Wildlife. Personal Communication. December 1991.

paralleled that of the individual districts. It should be noted that, as a result of the economic interactions within the larger analysis area, the individual district results do not sum to the values calculated for all districts. Some areas have greater natural resource dependence with more direct effects as a result, while other areas have greater economic diversity with more indirect effects as a result. Table 4-SE-3 displays the results of the western Oregon cumulative analysis for the BLM alternatives.

The management of BLM's timber resource is only one component of a larger economy. The FSEIS examined the cumulative effects on timber industry employment of ten alternatives. Alternative 9 was selected in the Record of Decision and is the focus of the following discussion.

The analysis of cumulative effects was conducted using regional coefficients representing timber industry employment affected per million board feet of timber harvest. Timber industry employment was defined as solid wood products plus pulp and paper. Self-employment, wage, and salary employment was included.

Within Oregon, subregional differences were identified. Employment in solid wood products was similar for all regions except the Central region (Deschutes, Klamath, Lake, Jefferson, and Wasco counties). In the Central region, approximately 16 jobs per million board feet are effected. For the remaining subregions, approximately nine jobs per million board feet are effected. The Northwest region (Clackamas, Clatsop, Columbia, Hood River, Marion, Multnomah, Polk, Tillamook, Washington, and Yamhill counties) was identified as having significant pulp and paper employment, 2.19 jobs per million board feet. The remaining subregions have limited pulp and paper employment per million board feet.

Overall, timber industry employment in western Oregon is projected to decline 23 percent from 1990 levels under Alternative 9. A 40 percent reduction from the 1990 employment level is projected for the southwest subregion. A decline of 28 percent is projected for the West-Central subregion. The Northwest and Central regions are both projected to experience less than 10 percent reductions in timber industry employment from the 1990 level.

Table 4-SE-2. Estimated Dependent Personal Income and Employment by Alternative

			Alternatives													
Personal Income, Millions (1989 Dollars)	**1984-1988**		**NA**		**A**		**B**		**C**		**D**		**E**		**PRMP**	
	Direct	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Total	21.193	45.487	22.158	47.042	29.470	62.858	27.300	58.095	10.079	20.399	10.940	22.361	6.330	12.373	8.741	17.652
Farm	0.005	0.038	0.006	0.058	0.006	0.072	0.006	0.070	0.007	0.050	0.007	0.048	0.008	0.036	0.008	0.040
Nonfarm	21.188	45.137	22.152	46.638	29.464	62.330	27.293	57.600	10.072	20.166	10.932	22.121	6.322	12.219	8.733	17.459
Ag. Serv., For., Fish, and Other	0.000	0.678	1.543	2.208	2.118	3.024	2.033	2.862	1.899	2.123	1.632	1.893	0.579	0.688	0.857	1.051
Mining	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.002	0.000	0.001	0.000	0.001	0.000	0.000	0.000	0.001
Construction	0.000	0.736	0.000	0.737	0.000	0.989	0.000	0.911	0.000	0.290	0.000	0.327	0.000	0.174	0.000	0.259
Manufacturing	19.474	31.478	18.498	29.965	25.235	40.867	23.040	37.320	5.625	9.188	6.793	11.066	2.798	4.586	5.130	8.359
Nondurable Goods	0.071	0.294	0.089	0.345	0.089	0.419	0.093	0.403	0.104	0.255	0.103	0.260	0.118	0.232	0.111	0.246
Paper & Allied Products	0.000	0.002	0.000	0.011	0.000	0.014	0.000	0.013	0.000	0.006	0.000	0.007	0.000	0.005	0.000	0.006
Durable Goods	19.403	31.184	18.409	29.620	25.146	40.449	22.947	36.917	5.521	8.933	6.690	10.806	2.680	4.354	5.019	8.112
Lumber & Wood Products	19.403	30.919	18.409	29.345	25.146	40.082	22.947	36.578	5.521	8.811	6.690	10.673	2.680	4.279	5.019	8.007
Transportation & Pub. Utilities	0.224	2.018	0.276	2.168	0.276	2.782	0.290	2.615	0.331	1.225	0.326	1.289	0.381	0.959	0.356	1.134
Wholesale Trade	0.035	0.109	0.043	0.123	0.043	0.147	0.045	0.142	0.052	0.097	0.051	0.098	0.060	0.093	0.056	0.096
Retail Trade	0.461	2.169	0.568	2.478	0.568	3.088	0.596	2.945	0.690	1.696	0.670	1.731	0.783	1.425	0.732	1.574
Finance, Insurance & Real Estate	0.000	1.567	0.000	1.737	0.000	2.292	0.000	2.136	0.000	0.911	0.000	0.955	0.000	0.581	0.000	0.762
Services	0.993	6.380	1.224	7.221	1.224	9.141	1.289	8.666	1.485	4.636	1.461	4.762	1.721	3.711	1.603	4.224
Government	0.000	0.313	0.000	0.346	0.000	0.456	0.000	0.425	0.000	0.182	0.000	0.191	0.000	0.118	0.000	0.153
Federal, Civilian	0.000	0.219	0.000	0.243	0.000	0.319	0.000	0.298	0.000	0.130	0.000	0.136	0.000	0.085	0.000	0.110
State and Local	0.000	0.094	0.000	0.103	0.000	0.136	0.000	0.127	0.000	0.052	0.000	0.055	0.000	0.032	0.000	0.043

	1984-1988		**NA**		**A**		**B**		**C**		**D**		**E**		**PRMP**	
Employment (Jobs)	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**	**Direct**	**Total**
Total	1,048	2,199	1,245	2,467	1,624	3,252	1,524	3,033	754	1,321	768	1,378	494	838	616	1,096
Farm	1	8	1	12	1	15	1	15	2	10	2	10	2	7	2	8
Nonfarm	1,047	2,174	1,243	2,437	1,622	3,213	1,523	2,996	752	1,302	776	1,359	492	825	614	1,080
Ag. Serv., For., Fish, and Other	0	85	201	284	276	390	265	369	248	276	213	246	75	90	112	136
Mining	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Construction	0	21	0	21	0	28	0	26	0	8	0	9	0	5	0	7
Manufacturing	880	1,171	837	1,116	1,141	1,521	1,042	1,389	256	346	309	416	129	176	234	315
Nondurable Goods	5	17	6	20	6	24	6	23	7	15	7	16	8	14	7	15
Paper & Allied Products	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Durable Goods	876	1,154	831	1,096	1,135	1,497	1,035	1,366	249	331	302	400	121	162	227	301
Lumber & Wood Products	876	1,140	831	1,082	1,135	1,478	1,035	1,349	249	325	302	394	121	158	227	295
Transportation & Pub. Utilities	9	82	12	88	12	113	12	106	14	50	14	52	16	39	15	46
Wholesale Trade	2	20	2	21	2	28	2	26	2	11	2	11	3	8	3	10
Retail Trade	39	169	48	193	48	239	50	229	57	134	56	137	66	114	61	125
Finance, Insurance & Real Estate	0	93	0	104	0	137	0	128	0	55	0	58	0	35	0	46
Services	117	534	145	609	145	758	152	724	176	421	173	430	204	359	190	394
Government	0	16	0	18	0	23	0	22	0	9	0	10	0	6	0	8
Federal, Civilian	0	8	0	9	0	12	0	11	0	5	0	5	0	3	0	4
State and Local	0	8	0	9	0	11	0	11	0	4	0	5	0	3	0	4

SOURCE: USDI, BLM 1989b

Table 4-SE-3. Estimated Dependent Personal Income and Employment by Alternative, Western Oregon BLM

			Alternatives													
Personal Income, Millions (1989 Dollars)	1984-1988		NA		A		B		C		D		E		PRMP	
	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total
Total	111.057	254.892	112.261	257.286	145.002	333.352	131.645	302.220	47.819	107.514	51.501	115.954	39.842	88.756	29.974	65.915
Farm	0.088	0.284	0.088	0.356	0.105	0.436	0.091	0.394	0.084	0.249	0.079	0.241	0.069	0.200	0.088	0.214
Nonfarm	110.969	252.980	112.173	255.202	144.896	330.702	131.555	299.811	47.735	106.471	51.422	114.874	39.773	87.901	29.887	65.179
Ag. Serv., For., Fish, and Other	0.010	5.191	6.538	11.515	8.230	14.767	7.410	13.306	4.665	6.509	3.935	5.976	2.316	3.825	2.814	3.824
Mining	0.000	0.017	0.000	0.017	0.000	0.022	0.000	0.020	0.000	0.007	0.000	0.008	0.000	0.006	0.000	0.005
Construction	0.000	3.575	0.000	3.499	0.000	4.555	0.000	4.123	0.000	1.395	0.000	1.525	0.000	1.162	0.000	0.830
Manufacturing	104.873	173.346	99.001	164.433	130.380	216.310	117.517	195.043	35.538	59.720	39.734	66.569	29.295	49.217	18.936	32.207
Nondurable Goods	0.294	4.861	0.325	5.259	0.309	6.563	0.323	6.041	0.365	2.785	0.375	2.912	0.392	2.425	0.392	2.073
Paper & Allied Products	0.000	0.566	0.000	0.620	0.000	0.783	0.000	0.717	0.000	0.311	0.000	0.325	0.000	0.262	0.000	0.220
Durable Goods	104.579	168.485	98.675	159.173	130.072	209.746	117.193	189.003	35.174	56.935	39.359	63.658	28.903	46.792	18.544	30.134
Lumber & Wood Products	104.579	165.154	98.675	155.855	130.072	205.439	117.193	185.100	35.174	55.574	39.359	62.182	28.903	45.664	18.544	29.309
Transportation & Pub. Utilities	0.622	12.587	0.681	12.971	0.646	16.486	0.679	15.068	0.770	6.126	0.792	6.522	0.832	5.271	0.830	4.233
Wholesale Trade	0.127	0.771	0.139	0.807	0.132	0.977	0.139	0.913	0.157	0.483	0.162	0.507	0.170	0.453	0.170	0.401
Retail Trade	1.665	9.742	1.819	10.544	1.726	12.926	1.816	11.999	2.057	6.046	2.116	6.310	2.224	5.458	2.218	4.791
Finance, Insurance & Real Estate	0.000	11.073	0.000	11.843	0.000	15.202	0.000	13.822	0.000	5.398	0.000	5.690	0.000	4.403	0.000	3.496
Services	3.672	36.678	3.996	39.573	3.783	49.458	3.994	45.518	4.548	20.786	4.683	21.766	4.936	18.107	4.919	15.392
Government	0.000	1.628	0.000	1.729	0.000	2.214	0.000	2.015	0.000	0.794	0.000	0.839	0.000	0.656	0.000	0.522
Federal, Civilian	0.000	1.183	0.000	1.259	0.000	1.610	0.000	1.466	0.000	0.583	0.000	0.616	0.000	0.483	0.000	0.387
State and Local	0.000	0.445	0.000	0.470	0.000	0.604	0.000	0.549	0.000	0.211	0.000	0.223	0.000	0.172	0.000	0.135

	1984-1988		NA		A		B		C		D		E		PRMP	
Employment (Jobs)	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total	Direct	Total
Total	5,299	12,204	6,107	13,236	7,760	16,982	7,080	15,442	3,031	6,078	3,126	6,382	2,437	4,920	2,048	3,930
Farm	15	58	15	72	17	89	15	81	14	50	13	48	12	40	15	42
Nonfarm	5,285	12,068	6,093	13,081	7,742	16,788	7,065	15,265	3,017	5,991	3,112	6,294	2,425	4,849	2,033	3,863
Ag. Serv., For., Fish, and Other	0	756	1,024	1,751	1,289	2,245	1,161	2,022	730	998	616	913	362	580	440	586
Mining	0	1	0	1	0	1	0	1	0	0	0	0	0	0	0	0
Construction	0	132	0	130	0	169	0	153	0	52	0	56	0	43	0	31
Manufacturing	4,734	6,574	4,469	6,247	5,885	8,213	5,304	7,407	1,605	2,280	1,795	2,539	1,324	1,880	856	1,237
Nondurable Goods	15	224	16	247	15	307	16	283	18	133	19	138	19	115	19	100
Paper & Allied Products	0	24	0	26	0	32	0	30	0	13	0	13	0	11	0	9
Durable Goods	4,719	6,350	4,453	6,000	5,869	7,906	5,288	7,124	1,587	2,147	1,776	2,401	1,304	1,765	837	1,137
Lumber & Wood Products	4,719	6,186	4,453	5,838	5,869	7,695	5,288	6,934	1,587	2,082	1,776	2,329	1,304	1,711	837	1,098
Transportation & Pub. Utilities	23	463	26	477	24	606	25	554	29	225	30	240	31	194	31	155
Wholesale Trade	5	145	6	146	5	188	6	171	6	64	6	69	7	54	7	42
Retail Trade	132	753	144	815	137	997	144	926	163	469	168	490	176	425	176	373
Finance, Insurance & Real Estate	0	601	0	646	0	828	0	753	0	296	0	312	0	242	0	193
Services	391	2,643	425	2,871	402	3,541	425	3,279	484	1,606	499	1,676	526	1,432	524	1,247
Government	0	78	0	83	0	106	0	97	0	38	0	40	0	31	0	25
Federal, Civilian	0	44	0	47	0	60	0	54	0	22	0	23	0	18	0	14
State and Local	0	34	0	36	0	47	0	43	0	16	0	17	0	13	0	10

SOURCE: USDI, BLM 1989b

Impacts to County Revenues

Future prices for timber stumpage in the Northwest are a key determinant of future revenue effects. O&C payments to counties, severance taxes, and federal treasury receipts are all determined by the level of BLM timber harvest.

Table 4-SE-4 displays the assumed prices and harvest levels by alternative together with the estimated O&C payments to each county. Prices under all alternatives are projected to increase significantly from the baseline period due to external factors beyond the scope of BLM's management alternatives (such as reduced harvest on national forestlands within the northern spotted owl region). Under Alternatives NA, A, and B, which maintain harvest levels close to those of the baseline period, county O&C revenues would increase significantly over those of the baseline period. This is because external factors will trigger timber prices higher than those of the baseline period. Under Alternatives C, D, E, and the PRMP, increased stumpage prices will not mitigate timber harvest reductions, thus reducing O&C payments to counties below those during the baseline period. In recent years, legislation has provided for additional "safety net" payments to the counties. As an example, in Fiscal Year 1991, payment of 9.6 million was guaranteed. This was 128 percent greater than the average payment during the baseline period. Current legislation specifies a gradual ramping down of the guaranteed payment level from the 1986-1990 average payment. These "safety net" payments have mitigated a large portion of county revenue impacts of reduced BLM harvest under the recent court injunctions. Table 4-SE-4 does not incorporate this legislation into the estimates displayed.

Payments in lieu of taxes (PILT) made for a variety of federal lands within each county will remain unchanged under all alternatives. Potential changes in land tenure by the BLM and other federal agencies could alter the level of payment made to the county. County revenue impacts of specific exchanges or disposals are evaluated as they are proposed and are not included in this document.

Approximately 5 percent of the revenues generated by public domain (PD) lands are dispersed through the state to counties proportionate to the land area within the county. Historically, timber harvest has been the dominant source of revenue from these lands. Based on estimated PSQs, revenues of Alternatives A and B will increase. Under Alternatives C, D, E, and the PRMP, revenues will be reduced proportionally. The counties must use these revenues to build roads and bridges. Opportunities exist in the future to increase revenue collections for use of PD lands. For example, collections associated with special forest products permits and special recreation permits will increase as these programs expand.

Under Alternatives NA, C, D, E, and the PRMP, harvest volumes subject to state Forest Products Harvest Tax will decline from baseline levels. Given constant tax rates, revenues could be expected to decline under these alternatives. Decreases in revenues will negatively impact programs funded by this tax, such as forest research and fire prevention or suppression. The Oregon State Legislature sets the tax rate and in recent bienniums has significantly increased the tax rate, as well as a number of programs funded by the tax. In future sessions, the legislature could increase the tax rate to maintain constant revenue streams despite decreased harvest volumes.

Cumulative County Revenue Impacts

After examining the impacts of reduced timber harvest on both BLM and Forest Service lands, the FSEIS concluded that anticipated timber price increases would not fully offset the revenue declines to the federal and local governments from implementation of the FSEIS alternatives.

Several state and county issues would make it difficult for counties to replace federal timber revenues. Among the issues are passage of Ballot Measure 5 Property Tax Limitation and a general anti-tax sentiment among voters as demonstrated by the defeat of several sales tax initiatives. Interviewed individuals and county officials in rural counties also expressed concern about decreasing tax base (Richardson 1993).

Impacts to Community Structure and Attributes

Recent discussions of community stability by natural resource sociologists have identified three broad definitions for human communities: a geographic area, local social systems, and types of relationships. Examples of these communities include town, county or state boundaries, commuting area, or relationships such as occupation or religious affiliation.

Table 4-SE-4. Projected O&C Payments to Counties Attributable to Timber Harvest in Western Oregon (millions of constant dollars)

	1984-1988 AVERAGE	NA	A	B	C	D	E	PRMP
Benton	$1,769,803	$3,652	$4,761	$4,333	$1,352	$1,521	$1,115	$724
Clackamas	$3,477,507	$7,213	$9,403	$8,558	$2,670	$3,005	$2,203	$1,430
Columbia	$1,301,733	$2,677	$3,490	$3,176	$991	$1,115	$818	$531
Coos	$4,147,923	$7,668	$9,996	$9,097	$2,838	$3,195	$2,342	$1,520
Curry	$2,290,459	$4,743	$6,184	$5,628	$1,756	$1,976	$1,449	$941
Douglas	$15,849,850	$32,555	$42,439	$38,625	$12,051	$13,563	$9,943	$6,456
Jackson	$9,827,578	$20,364	$26,548	$24,162	$7,538	$8,485	$6,220	$4,038
Josephine	$7,578,734	$15,699	$20,466	$18,626	$5,811	$6,541	$4,795	$3,113
Klamath	$1,464,310	$3,041	$3,964	$3,608	$1,126	$1,267	$929	$603
Lane	$9,627,286	$19,845	$25,870	$23,545	$7,346	$8,268	$6,061	$3,935
Lincoln	$233,964	$468	$610	$555	$173	$195	$143	$93
Linn	$1,669,253	$3,431	$4,473	$4,071	$1,270	$1,429	$1,048	$680
Marion	$918,862	$1,897	$2,474	$2,251	$702	$791	$580	$376
Multnomah	$684,730	$1,417	$1,847	$1,681	$524	$590	$433	$281
Polk	$1,359,256	$2,807	$3,659	$3,331	$1,039	$1,170	$857	$557
Tillamook	$355,409	$728	$949	$863	$269	$303	$222	$144
Washington	$397,918	$819	$1,067	$971	$303	$341	$250	$162
Yamhill	$460,400	$936	$1,220	$1,110	$346	$390	$286	$186
Total	$63,414,974	$129,958	$169,418	$154,190	$48,107	$54,145	$39,693	$25,771
Assumed Price[1]	$707	$1,608	$1,576	$1,589	$1,674	$1,667	$1,680	$1,692
Total Volume (MMCF)	202,020	191	251	227	68	76	56	36
O&C Volume (MMCF)	171,979	162	215	194	57	65	47	30

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[1] Prices estimated based on an index of 1982 constant dollars scaled to the 1984-88 actual average price of $707.34.

Community stability is an often stated desire of all types of communities. Stability is a misnomer, however, since communities are in a constant state of transition and the status quo is rarely maintained. Attributes of prosperity, adaptability, cohesiveness, and ability to absorb and cope with change have been identified as desirable by some definitions of community stability (Society of American Foresters 1989). These definitions recognize change and seek orderly change as a desired goal.

Many geographic, social, or relational factors affect the above listed desired attributes of any community. These factors include economic diversity, economic stability, population stability, social cohesion or community solidarity, structural diversity, location, quality of life, human capital, size, and local leadership (FSEIS 1994). In the Pacific Northwest, timber or forest dependence is identified as a destabilizing factor in the FSEIS when considering the recent changes in forest management.

The FEMAT report and FSEIS identify attributes of communities likely to experience economic and social impacts that will disrupt existing community structures and trends. Communities with these attributes were labeled "most at risk." Specifically, the FSEIS text (page 2-82) states as follows:

> The "most at risk" communities differ from others in significant ways. These communities are smaller (average population 3,000), and they are located in counties with low population density. Isolated communities are more likely to experience negative consequences... because they have fewer employment options available locally or in nearby communities, and because of limited access to capital, transportation links, and other resources. Communities that are small, isolated, and lacking in economic diversity are more likely to be "at risk" than others. These communities may find it difficult to mobilize and respond to changing conditions that may affect a variety of groups. These communities are likely to experience unemployment, increased poverty, and social disruption in the absence of assistance.

Timber industry impacts are estimated to vary substantially by subregion and BLM district. The southwest region, which includes the Medford District, is identified as having the greatest potential for job displacement in the timber industry and the fewest opportunities for alternative employment (Phillips 1994). However, urban areas in Jackson and Josephine counties are experiencing rapid economic development in terms of housing construction and addition of retail space. Adverse economic impacts to the more rural, timber dependent communities such as Glendale, Butte Falls, Merlin, and Cave Junction, is expected to be much more severe than in larger communities such as Ashland, Grants Pass, and Medford that have more diverse economies. However, community motivation can overcome potential adverse effects.

People interviewed the summer of 1993 by Richardson described the development of a two-tier economic system, particularly in the rural areas experiencing influxes of well-to-do in-migrants. Newcomers were seen buying or building expensive homes while middle-income rural residents were losing economic ground. These losses were tied to employment losses in the lumber and wood products, shifts to lower paying trade and service jobs, and outmigration (Richardson 1993). Mill closures in the area were also described as the loss of companies with a commitment to invest in its local community, economically and otherwise (Richardson 1993).

Jackson and Josephine counties are highly dependent on federal forest receipts, with approximately 20-30 percent of their total budgets derived from O&C receipts (Lee et al. 1991). Impacts of revenue reductions were identified in interviews conducted as part of the Lee et al. study. In Jackson County, health service needs are predicted to increase with unemployment caused by federal forest management plans, while services available will be reduced. Satellite clinics could close, preventive and mental health programs could be reduced, and fees could increase. In Josephine County, preventive care and educational programs are expected to be eliminated. These impacts could occur at a time when the county is expected to become the primary care provider to the unemployed and working poor. Law enforcement in both counties also anticipates service reductions from decreased federal forest revenues (Lee et al. 1991).

There is some concern about the adoption of tourism as an economic development strategy by several communities in the Medford District. The concern is that additional tourism will produce highly seasonal employment and low wages, rather than stable, year-round employment (Richardson 1993).

Effects on Rural Interface Areas

The rural interface area (RIA) issue is generally driven by BLM neighbors' concerns that timber management, grazing, and mining could jeopardize their viewshed, open space, domestic water sources, or other aspects of their neighborhood environment (see Chapter 3, Rural Interface Areas for a list of effects related to BLM management in the planning area).

Resource management activities such as road construction, timber harvest, and minerals development could create adverse effects on neighbors living in RIAs. In turn, the reactions of neighbors to these activities could create costs (e.g., decisions to defer or not harvest timber) or additional costs for BLM to manage resources in RIAs. In some situations, the number of neighbors and the number of resource management activities are directly proportional to the number of conflicts and the additional costs to BLM.

All of the RIAs in the planning area have been analyzed for potential conflicts with neighbors. Potential effects are analyzed by three different methods: a historical analysis of public concern and the BLM management identification of sensitive communities, a spatial study of the anticipated levels of conflict by analytical watershed, and a survey study of the anticipated levels of conflict under each alternative. The three methods of analysis compliment each other without always agreeing with each other.

The increased use of helicopter logging envisioned in Alternatives C, E, and the PRMP (which incorporates Alternative 9) will have an increased noise impact on residents living in the rural interface. These impacts will occur during daylight operating hours. The frequency could vary from as few as 2 to as many as 150+ passes per day. Previous experience indicates that rural interface residents are most often effected in the early morning and late evening hours. In many cases, noise from the helicopter is audible most of the day with the greatest amount of noise audible when the helicopter is within 500 feet. Family relationships can become strained and domestic livestock and wildlife can be disturbed. Possible helicopter logging restrictions could include hours of operation, location of landings, flight paths, and others. These restrictions reduce but do not eliminate noise associated effects. This is an unavoidable adverse effect resulting from the increased use of helicopter logging required to implement the PRMP. This adverse impact will occur more frequently as the population of the rural interface continues to increase.

Historical Analysis

The effects from the historical analysis reflect the historical public concern and the BLM management identification of sensitive communities (see Chapter 3, RIA) from implementing the No Action (NA) Alternative. This historical analysis does not consider any other alternative. A majority of the protests and appeals were concerned with clearcutting, size of clearcuts, visual resources, the National Environmental Policy Act, the O&C Act, the Medford District Office environmental impact statements and land use plans, water quality and quantity, threatened and endangered plants, multiple-use, and the northern spotted owl (Isberg 1991). The anticipated levels of conflict for the NA Alternative are not expected to change from the levels identified in Chapter 3.

Spatial Analysis

Analysis of the anticipated levels of conflict by analytical watershed is based on a spatial interaction model (see Appendix 4-RIA-1, Draft RMP). The model's assumption is that potential for conflict between rural residential living activities and intensive forest management practices are directly proportional to the density or magnitude of the activities (i.e., number of potential residences and estimated acres managed for timber production) in the RIA and inversely proportional to the distance between the two activities. For analysis purposes, the estimated acres managed for timber production are used to represent all management activities in the public RIA. The acres of land in the 1-5 and 6-20 zoned areas reflect the number of potential residences that could be created in the private RIAs by analytical watershed (see Table 3-RIA-2).

The acres of land allocated to timber production within the public RIA of analytical watersheds are estimated in Table 4-RIA-1. The relationship of these estimated acres to the number of potential residences in the RIA is the foundation of the spatial analysis. The estimated acres do not vary greatly by any alternative except for Alternative E, which has substantially fewer acres allocated to timber production. However, there is a substantial difference in the ratio of acres allocated to intensive timber management and restricted timber management acres by alternative. For more information concerning this relationship and the spatial analysis model, refer to the paper entitled, "Assessing Public Concern In The Rural Interface Area With A Spatial Interaction Model" (USDI, BLM, MDO 1992). For analysis purposes the lands allocated to intensive timber management are assumed to be clearcut acres.

Table 4-RIA-2 depicts the anticipated levels of potential conflict by alternative and analytical watershed. The potential conflicts are derived from the spatial interaction model, which assumes everything is equal except potential dwellings in the private RIA and the estimated acres allocated to timber production in the public RIA (USDI, BLM, MDO 1992). The model does not take into account real community values but assumes that in the long term all communities would have equal access to information, networking with other communities, financial support, etc.

Table 4-RIA-1. Estimated Acres Allocated to Timber Production Within the Public RIA of Analytical Watersheds[1]

Analytical Watershed[2]	NA[3]	A[4]	B[4]	C[4]	D[4]	E[4]	PRMP[4]
Bear Creek		4,180	4,114	3,135	2,547	653	3,918
Big Butte Creek		4,631	4,222	3,813	4,018	1,362	4,426
Camp Creek		41	30	50	0	0	33
Cottonwood Creek		576	512	416	160	32	512
Cow Creek-Galesville		0	0	0	0	0	0
Cow Creek-Glendale		2,341	2,197	2,197	1,387	752	2,226
Deer Creek		5,121	4,524	4,267	2,048	854	4,865
Elk Creek		2,323	2,173	1,836	75	150	2,136
Evans Creek		11,077	10,214	8,919	9,350	2,446	10,357
Grave Creek		9,804	8,643	7,224	8,127	2,838	9,288
Jenny Creek		7,089	6,568	4,170	3,440	313	6,568
Jumpoff Joe Creek		8,097	7,978	7,740	7,14	1,191	7,740
Little Applegate		5,707	5,198	4,994	4,790	510	5,402
Little Butte Creek		7,426	6,698	5,679	4,660	1,456	6,844
Lost Creek		2,871	2,324	2,188	2,324	820	2,780
Lower Applegate		6,927	6,791	5,840	3,395	951	6,519
Middle Applegate		14,400	13,725	13,275	12,600	2,700	13,725
N. Fork Silver Creek		0	0	0	0	0	0
Rogue-Gold Hill		14,212	12,767	11,322	12,285	2,168	13,490
Rogue-Grants Pass		6,211	6,211	6,973	5,557	545	5,993
Rogue-Recreation Sec.		4,602	4,515	2,431	1,563	261	4,429
Rogue-Trail Creek		5,244	4,588	4,260	3,933	328	4,752
Rogue-Wild section		0	0	0	0	0	0
Upper Applegate		1,519	1,496	1,005	1,286	140	1,426
Upper Illinois		9,259	8,725	8,013	17,806	1,603	8,725
West Fork Cow Creek		0	0	0	0	0	0
Williams Creek		5,050	4,641	3,617	1,843	1,297	4,504
Totals		**138,708**	**128,854**	**113,364**	**110,338**	**23,370**	**130,658**

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[1] This table summarizes the estimated acres allocated to timber production within the public RIA of analytical watersheds by alternative. The public RIA is within one-half mile from the private RIA (see Chapter 3, Rural Interface Areas).

[2] See Appendix 3-WA-2 for explanation of analytical watersheds.

[3] No allocations were assigned to the NA alternative. This alternative's allocation is assumed to be close to Alternative B.

[4] See Appendix 4-RIA-1 for an explanation of how the estimated acres were calculated (USDI, BLM, MDO 1992).

The spatial analysis identified variability in the potential for RIA conflicts across analytical watersheds. For example, the following watersheds would have substantial conflicts across all alternatives except for Alternative E: Jumpoff Joe Creek, Rogue-Gold Hill, Rogue-Grants Pass, and Upper Illinois. Other watersheds (i.e., Cow Creek-Galesville, North Fork Silver Creek, Rogue-Wild section, and West Fork Cow Creek) have no identified private or public RIA land and therefore are projected to have no RIA conflicts (see Table 4-RIA-2).

The identified potential for RIA conflicts also varies by alternative with the greatest potential for conflicts projected for Alternatives A and B and the NA Alternative. The least potential for RIA conflicts would be under Alternative E. The PRMP would have potential for conflicts similar to Alternatives C and D.

Survey Analysis

This analysis draws from: 1) a survey of RIA land owners conducted by Southern Oregon State College (SOSC) and funded by the Society of American Foresters (Sturtevant 1991a), and 2) interviews with key political and organizational leaders involved in planning and land use in the rural interface

Table 4-RIA-2. Levels of Potential Conflict By Analytical Watershed[1]

Watershed[2]	NA[3]	A	B	C	D	E	PRMP
Bear Creek		1	1	1	1	1	1
Big Butte Creek		1	1	1	1	1	1
Camp Creek		0	0	0	0	0	0
Cottonwood Creek		1	1	1	1	1	1
Cow Creek-Galesville[4]		0	0	0	0	0	0
Cow Creek-Glendale		1	1	1	1	1	1
Deer Creek		2	2	1	1	1	1
Elk Creek		1	1	1	1	1	0
Evans Creek		4	4	2	2	1	1
Grave Creek		3	3	1	1	1	3
Jenny Creek		1	1	1	1	1	1
Jumpoff Joe Creek		5	5	3	3	1	3
Little Applegate		1	1	1	1	1	1
Little Butte Creek		2	2	1	1	1	1
Lost Creek		1	1	1	1	1	1
Lower Applegate		5	5	3	2	1	3
Middle Applegate		4	4	2	2	1	2
N. Fork Silver Creek[4]		0	0	0	0	0	0
Rogue-Gold Hill		5	5	3	3	1	3
Rogue-Grants Pass		5	5	4	3	1	3
Rogue-Recreation Sec.		3	2	1	1	1	1
Rogue-Trail Creek		3	2	1	1	1	2
Rogue-Wild section[4]		0	0	0	0	0	0
Upper Applegate		1	1	1	1	1	1
Upper Illinois		5	5	3	5	1	4
West Fork Cow Creek[4]		0	0	0	0	0	0
Williams Creek		2	2	1	1	1	1
District Summary		3	3	2	2	1	2

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[1] Levels of potential conflict are described as a range from the highest impact to the lowest impact with 5 equalling the highest and 1 equalling the lowest. A value of zero (0) equals no effect. See Appendix 4-RIA-1 for a clarification of the levels and how they were calculated (USDI, BLM, MDO 1992).

[2] See Appendix 3-WA-2, Draft RMP, for explanation of analytical watersheds.

[3] The effects of the NA alternative are assumed to be equal to the effects for Alternative B because of the similarity of the allocations.

[4] These analytical watersheds have no identified private or public RIA lands and therefore have no RIA conflicts (see Table 3-RIA-2, Draft RMP).

conducted by SOSC and funded by BLM (Sturtevant 1991b). Table 4-RIA-3 depicts the anticipated levels of conflict perceived to occur under each alternative as described by the alternatives' RIA defined goals and objectives. Appendix 4-RIA-2, Draft RMP, describes in greater detail the effects by alternative.

The levels of conflict would vary by two categories of neighbors (Groups A and B) living in the RIA. Table 4-RIA-3 describes the level of concern as an increase or decrease from the NA Alternative. The rationale for these effects is presented in the contracted survey study (Sturtevant 1991b).

Group A includes not only people who have lived in the RIA for more than a decade but also older residents and those who have less education (three variables which were correlated) as well as some engaged in the timber industry. Although this group emerged in the survey through their choice of paired statements (Sturtevant 1991a), they were not as readily identified in interviews with community leaders and organizations and did not have a ready response to questions about specific BLM management activities (Sturtevant 1991b). Interface residents who belong to groups advocating active resource management tend to have goals such as releasing wilderness or large-tract areas for timber harvesting. Community stability through active forest management (i.e., higher levels of timber harvest) is a goal of this group, although not necessarily in interface watersheds.

Group B represents more recent residents, mainly exurbanites, younger than Group A but also include a significant portion of recent retirees. This group is also more highly educated, spends more time recreating in the forest, and are more likely to be networked into environmental groups. These are the residents who would readily express specific concerns about forest management on BLM and other actively managed public and private forestlands.

A summary of Table 4-RIA-3 for the all neighbors category is that the identified potential for RIA conflicts also varies by alternative. The NA Alternative is the baseline for this analysis and has been identified as having high RIA conflicts. The survey analysis describes anticipated levels of conflict as an increase or decrease from the NA Alternative. The greatest potential for increased conflicts would occur under Alternatives A and B. Alternatives C, D, and the PRMP would have decreasing conflicts. Overall, Alternative E would have some increase in RIA conflicts.

Conclusion

In summary, the historical, spatial, and survey analyses support each other in identifying high RIA effects for the NA Alternative. The spatial and survey analyses also support each other in identifying the highest RIA conflicts or an increase in conflicts for

Table 4-RIA-3. Rural Interface Management Effects Upon Neighbors[1]

	Level of Public Concern					
Category	A	B	C	D	E	PRMP[2]
Group A	High	Decrease decrease	Some	Some decrease	Increase increase	Some decrease
Group B	High	Increase increase	Some	Decrease decrease	Decrease	Some decrease
All Neighbors	High increase	Some increase	Decrease	Decrease	Some increase	Decrease

[1] Except for the PRMP, this table is extracted from the SOSC survey analysis study (Sturtevant 1991b).

[2] The anticipated levels of conflict for the PRMP are not derived from the SOSC analysis. The PRMP was not developed at the time the BLM-contracted study was conducted and therefore was not included in the analysis. The effects for the PRMP are identified as equal to Alternative C because of the similarity of the allocations for the two alternatives.

Alternatives A and B, and in identifying the lowest or a decrease in RIA conflicts for Alternatives C, D, and the PRMP. The spatial and survey analyses disagree for Alternative E, where the spatial analysis shows the lowest RIA effects and the survey analysis indicates some increased conflict.

It is anticipated that allocating lands to timber production within the RIA would create some level of controversy with some communities or neighbors no matter how lands are managed within the public RIA. This is an unavoidable adverse effect. Allocations in the PRMP (which are similar to that presented in Alternative 9 of the SEIS) should produce less conflict than any of the other alternatives, particularly for those residents described as Group B.

Effects on Wildfire

The intensity and size of any wildfire depends largely on the local weather at the time of and following ignition, long term and seasonal climatic patterns, amount and distribution of available fuel, the slope and aspect of the landscape on which the fire is burning, the availability of suppression forces, and the amount of time it takes to reach the wildfire and take suppression actions. Most of these factors remain constant under each of the alternatives, except for the type and level of fuels management. Suppression efficiency and effectiveness analysis is conducted at the activity planning level of management.

Due to the fragmented ownership pattern in most of the planning area, wildfire potential is not dependent on BLM land management activities alone. Historically, the majority of large stand replacement wildfires have involved multiple ownerships and either started in or were intensified by untreated logging and precommercial thinning slash fuel. Fire intensity and severity have also increased due to the exclusion of fires from fire dependent ecosystems. Salvage of dead and dying trees and stands could further reduce fuel hazard, but is not proposed for all land allocations under all alternatives.

Lightning has been the primary cause of wildfires throughout much of the planning area. Nearly 70 percent of all wildfires for the period 1980-1993 have been ignited by lightning. The occurrence rate for human-caused wildfires on BLM land has remained relatively constant. The acreage burned by human-caused fires has increased dramatically accounting over 90 percent of all the acreage burned on BLM land in the last five years. These increases are directly attributed to the planning areas dry climatic condition plus the continued accumulation of hazardous fuels. A large proportion of the ignitions are from illegal debris burning by private residences within the RIAs, power lines, and arson (see Table 4-WF-1).

Certain activities proposed in the alternatives change the risk of large scale, high intensity wildfires. The primary factors that could increase the relative risk of wildfire are an increased amount of fuel produced through forest management silvicultural treatments (e.g., precommercial thinning), the unnatural build up of fuels through fire exclusion due to wildfire suppression activities, as well as the natural successional changes in ecosystems. Unless fuels are actively managed, this increased risk will effect the objective of limiting the occurrence of large scale, high severity wildfires.

Prescribed burning and other types of fuels management that would reduce fuel buildups could decrease the relative risk of wildfire. Prescribed burning includes both traditional broadcast and pile burning as well as underburning prior to harvest. Underburning in ponderosa pine mixed conifer stands and Douglas-fir and tanoak/madrone associated stands; brush land burning, burning of white oak woodlands and grassland are also proposed as methods to reintroduce fire into these fire dependent ecosystems. Each of these ecosystems had some natural fire regime prior to fire suppression and will change in species composition, structure, and function without fire as a natural process.

Underburning can be used to reduce fuel loading and vertical fuel continuity. Wildfires in stands that are managed using underburning are generally less severe and fire suppression is aided thereby limiting the size of wildfires, while using methods that have a lower environmental impact and reducing the costs of wildfire suppression, particularly when underburning is implemented over large areas (USDI 1992).

Mosaics of stands and landscapes with varying forest ages, structures, and densities and with areas of reduced fuels would allow safe access for fire suppression crews and provide strategic locations for efficient and effective fire suppression. Due to the need to meet air quality standards, prescribed burning would not be planned for some harvest units. Other stand manipulation and site preparation methods would be used on some of these remaining units.

The specific objective and anticipated effects of fuel reduction activities is to mitigate site specific wildfire potential, which cannot be fully assessed at this planning scale but which should be considered in province-level, watershed and landscape-level analyses, as well as in site-specific project level planning.

Forest density management (thinning), conifer release by cutting hardwoods, and thinning of the forest understory will produce fuels that would remain a fire hazard until the material is reduced by natural decomposition (10 to 20 years), unless managed effectively. Thinning or brushing early in early successional stages can facilitate cost effective fuel hazard mitigation. Operationally, some timber harvest units planned for treatment with prescribed fire may not be promptly completed. These "untreated" acres directly contribute to a fuel hazard under Alternatives NA, A, B, which reflects traditional reforestation methods associated with even-age management.

Alternatives NA, A, and B have the greatest potential for increasing wildfire risk because of the large amounts of untreated logging slash, precommercial thinning slash, and hardwood slash that would be produced. Alternatives C, D, and the PRMP would produce moderate amounts of untreated slash, while Alternative E would produce the lowest amount (see Figure 4-WF-1 at the end of this chapter).

In Figure 4-WF-1, fuel treatment acres represents the area covered by flammable debris created from regeneration harvest, precommercial thinning and commercial thinning (density management), understory reduction, and manual brushing.

The amount of untreated flammable debris (fuel) varies by type of forest management harvest and cultural activity. Regeneration harvest creates the most fuel for the longest period of time, followed precommercial and commercial thinning, and brushing. Treatment acres represents the area where either prescribed fire or alternative treatments will be applied (see Figure 4-WF-1). Fuel treatment is only identified for forest harvest activities while other treatments activities are used for different resource management objectives such as fuel hazard reduction natural fuels allowed to accumulate over time.

Underburning as proposed in Alternatives B, C, D, E, and the PRMP would also reduce the risk of wildfire. Alternatives C, D, E, and the PRMP have the highest

Table 4-WF-1. Wildfire Occurrences on the District, 1980 to 1993.

	# Human-Caused Fires	# Human-Caused Ac.	# Lightning Fires	# Lightning Ac. Burned	Total # of Fires	Total # Ac. Burned
1980	14	594	20	30	34	624
1981	24	2,156	6	6	30	2,162
1982	13	90	27	29	40	119
1983	4	28	27	4	31	32
1984	16	84	25	8	41	92
1985	14	22	75	60	89	82
1986	15	58	24	8	39	66
1987	19	143	103	35,233	122	35,376
1988	30	356	25	1,506	55	1,862
1989	32	15	49	11	81	26
1990	23	97	28	160	51	257
1991	20	17	57	110	77	127
1992	26	4,657	115	23	141	4,680
1993	16	295	23	10	39	305
Total	266	8,612	604	37,198	870	45,810
Annual Average	19	615	43	2,657	62	3,272
Five Year Average (1989-93)	23	1,016	54	63	78	1,079

likelihoods of reducing the risk of wildfire through underburning, while Alternative B has a somewhat lower potential. Under Alternatives NA and A, no underburning is proposed and this would allow for the continued increase in fuels and subsequently increase the probability of a wildfire occurring over time compared with the other alternatives (see Figure 4-WF-1).

The prohibition of burning within the rural interface area (RIA) in Alternatives D and E would also have the same impact on increasing the probability (risk) of a wildfire in these areas from untreated fuels. This risk can sometimes be decreased by the use of alternative fuel treatments. The projected harvest acres and corresponding level of untreated slash is greater under Alternative D compared with Alternative E.

The PRMP proposes treating 10,300 acres designed to meet forest health restoration objectives not included in any other alternative. The use of understory reduction and restoration underburning is discussed in the Forest Health section of this document.

The PRMP, under the direction of the FSEIS/ROD, requires a heavy land allocation commitment to both Late-successional Reserves and Riparian Reserves compared with the other alternatives. These stands are the oldest on the district and the most susceptible to wildfires, due to the absence of natural fire and the over dense vegetative layers that create the conditions that are conducive to old growth associated species such as the northern spotted owl.

Watershed analysis and landscape level plans must determine the relative risk of loosing this critical habitat to wildfire and the mitigation activities needed to sustain these stands into the future at the landscape level.

Conclusion

Alternatives A and B would increase the potential risk of wildfire over the NA Alternative due to the increase in the amount of untreated flammable debris (slash) and lack of, or small amount of, planned underburning. Alternatives C, D, E, and the PRMP would reduce the risk of wildfire compared to the NA Alternative by increased fuels management including the use of underburning.

The BLM will continue to contract with the State of Oregon and the Oregon Department of Forestry for fire suppression services, including prevention and detection, under each of the alternatives. While the costs of the contract and actual fire suppression costs will vary under the range of alternatives, these costs cannot be determined at this time, as they are more dependent upon costs incurred from wildfires rather than from the potential of wildfire.

While management activities that reduce fuel hazards would help reduce potential wildfire risk, the potential for wildfire on all lands in the planning area under all alternatives would be expected to remain high for the short term. This is due to the continued increase in fuel hazard from forest management and cultural activities, conifer mortality associated with drought, and unnatural accumulations of fuels within established stands due to historical suppression of wildfire in some fire dependent or fire adapted plant communities.

A total fire protection strategy is likely to be unsuccessful in providing protection against catastrophic disturbance in the planning over the next 50 to 100 years, while fire severity will become skewed toward higher severity levels. The risk of large, high severity wildfires, as well as potential mitigation of that risk, is best determined at the watershed level and was not attempted in this RMP.

Consistency With Other Agency Plans and Programs

BLM planning regulations require that RMPs be consistent with officially-approved or adopted resource-related plans and the policies and procedures contained therein, of other federal agencies, state and local governments, and Indian tribes, so long as the guidance and RMPs are also consistent with the purposes, policies and programs of federal laws and regulations applicable to public lands..." (43 CFR 1610.3-2). Consistency is construed as the absence of conflict. Based on BLM's knowledge of the plans of such other agencies, the proposed RMP has been compared to the following agencies' plans, for consistency, and BLM has reached the conclusions stated.

Federal Agencies

The Proposed RMP is believed to be consistent with the following plans of other federal agencies:

- The Record of Decision on the 1994 *Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old growth Forest Related Species Within the Range of the Northern Spotted Owl.*

- The Forest Service's forestwide land use plans for the adjacent Rogue River, Siskiyou, and Umpqua National Forests.

- Soil Conservation Service watershed plans.

- The Endangered Species Act and the following Fish and Wildlife Service plans (see Effects on Threatened and Endangered Species):

  - Pacific Bald Eagle Recovery Plan,
  - Final Draft Northern Spotted Owl Recovery Plan,
  - Fish and Wildlife Service determination of critical habitat for the northern spotted owl, and
  - Peregrine Falcon Recovery Plan.

- The National Park Service's Nationwide Rivers Inventory (see Effects on Wild and Scenic Rivers).

- The Bonneville Power Administration's latest annual Transmission System Facilities Resource Program.

- The Northwest Power Planning Council, Columbia River Basin, Fish and Wildlife Program, and subordinate species-specific strategies.

State Government

The Proposed RMP is believed to be consistent with the following plans, programs, and policies of State of Oregon agencies:

- Department of Environmental Quality (see Effects on Air Resources)

  - Smoke Management Plan
  - Visibility Protection Plan and air quality policies
  - Prevention of Significant Deteriorationrequirements

- Water Resources Department river basin programs for the Rogue, Umpqua, and Klamath rivers

- Water Resources Commission rules and statutes

- Department of Human Resources, Health Division, standards for public water systems

- Department of Agriculture

  - Weed control plans
  - State-listed endangered plan species (see Effects on Special Status Species)

- Division of State Lands

  - Removal - Fill Law
  - Natural Heritage Program (See effects on Special Areas)

- Parks and Recreation Department

  - Statewide Comprehensive Outdoor Recreation Plan (see Effects on Recreation)
  - State Parks and Recreation System Plan
  - State Recreation Trails Plan (see Effects on Recreation)
  - State Historic Preservation Program
  - State Scenic Waterways Program and related projects.

- Department of Transportation, Highway Division

  - Oregon Highway Plan
  - Six-Year Highway Improvement Plan

- Economic Development Department, Regional Economic Development Strategies

Consistency of the alternatives with some other State plans and programs is more complex, as follows.

Consistency with the Department of Environmental Quality's Statewide Water Quality Management Plan (including Water Quality Standards and Guidelines) and the State's antidegradation policy would vary by watershed analyzed. The cumulative effects of timber harvest activities on BLM-administered lands plus other ownerships could lead to violation of the state's antidegradation policy in one or more of the watersheds analyzed, unless either private activities are less than anticipated (by BLM) or BLM can lessen the cumulative impacts by scheduling its timber sales to occur at different periods than most of the anticipated private timber harvest.

Consistency with the Department of Fish and Wildlife's many plans, policies, rules, and objectives are addressed in Appendix Y.

Consistency with the Board of Forestry's Forestry Program for Oregon (FPFO) is complex, due to the diversity of goals of the FPFO. Specificity regarding consistency with the five FPFO objectives is provided in Appendix Y.

The proposed plan would be consistent with the Oregon Benchmarks (Report to the 1993 Legislature by the Oregon Progress Board, December 1992) for water, forestland, wetlands, fish and wildlife, and outdoor recreation. It would not, however, be likely to support reaching the 1995 and 2000 benchmarks for increasing standard of living, affordable housing, family stability, and stable home life.

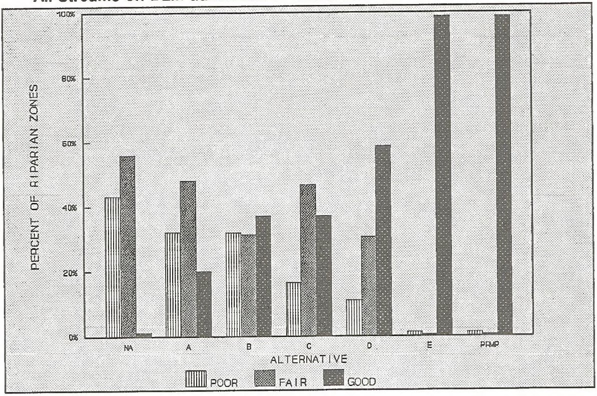
Consistency with the statewide planning goals and guidelines administered by the Land Conservation and Development Commission (LCDC) through the Department of Land Conservation and Development is variable among the 12 goals for which Medford District RMP consistency is relevant. Oregon's land use program was enacted 21 years ago. Today a complex body of land use policy and goal interpretations exists due to the acknowledgment process, goal amendments, LCDC rule making, and Land Use Board of Appeals and appellate court decisions. The matter of BLM consistency with the statewide goals involves a number of interrelated issues of policy, intergovernmental coordination and state and federal legal requirements. Consistency with these goals is characterized generally in Appendix Y.

The statewide planning goals are legally binding on all planning activity relating to land use undertaken by cities, counties, special districts, and state agencies. The planning goals function similarly for effected federal agencies making consistency determinations under the OCMP in accordance with the (Federal) Coastal Zone Management Act (CZMA). However, there are no lands within the Medford planning area that are within the Oregon Coastal Zone, therefore, a consistency determination with OCMP is not necessary.

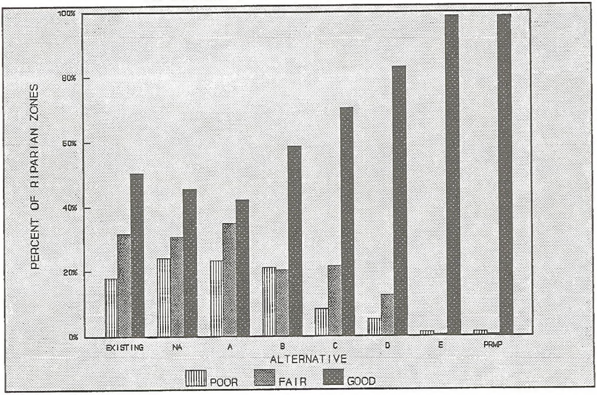
Local Government

The Oregon statewide planning program attached substantial importance to the coordination of federal plans with acknowledged local comprehensive plans. To the extent that BLM actions and programs are consistent with acknowledged county and city comprehensive plans and land use regulations, they can also be considered consistent with statewide planning goals. Local plans do not, however, address protection of Goal 5 values from the effects of forest management, as state law prohibits local governments from regulating forest practices. The comprehensive plan for Jackson, Josephine, Douglas, Coos, and Curry counties could be effected by the Medford District RMP.

The district has contributed data for development of county comprehensive plans, followed the development of those plans through the years, and consulted on issues of mutual interest. Based on knowledge gained through this involvement, the district planning staff believes that the Proposed RMP is consistent with the comprehensive plans and land use regulations cited above.



Long-Term Riparian Condition by Alternative
All Streams on BLM-administered Lands Available for Timber Harvest



Long-term Riparian Condition by Alternative
All Streams on BLM-administered Lands

Figure 4-RZ-1. Long-term Riparian Condition.

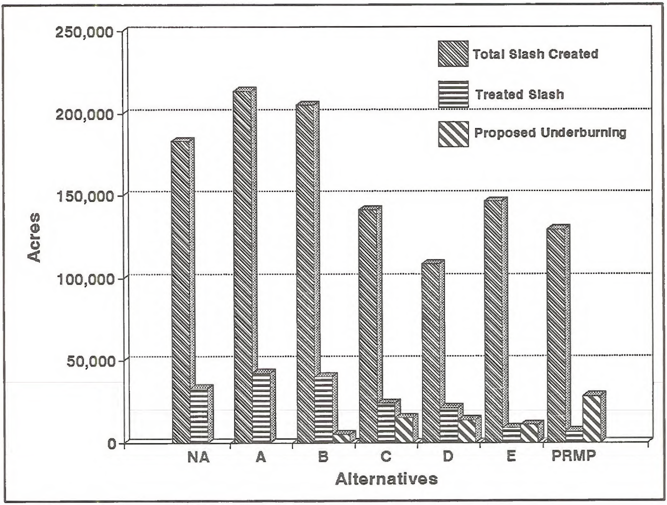


Figure 4-WF-1: Treatment of Resource Management Slash and Proposed Underburning (Acres for Decade)

Chapter 5
Consultation and Coordination

Summary of Major Changes

Inclusion of protest procedures.

Inclusion of discussion of consistency review.

Inclusion of a description of public involvement following publication of the Draft RMP/EIS.

Introduction

The Medford District Proposed Resource Management Plan/Final Environmental Impact Statement was prepared by an interdisciplinary team of specialists from the District Office with assistance from the Oregon State Office. Although the actual writing of the Draft RMP/EIS (published August 1992) began in early 1990, an elaborate process that began in 1986 preceded the writing phase. The planning process involved many steps (see Chapter 1, Planning Process Overview), with public participation, as well as consultation and coordination with many agencies and organizations.

This chapter described agencies and organizations BLM has worked with during the preparation of the PRMP/FEIS. This chapter has been significantly modified. It includes an updated Summary of Organizations to whom copies of the PRMP/FEIS have been sent and a Summary of Public Comments.

If you would like to have your interest/concerns considered by the District Manager as he makes the final decisions that will guide the management of the public lands in the Medford District for the next 10-15 years, please do so in writing prior to November, 1994. Comments on the PRMP/FEIS, to be considered in the decision making process on this PRMP, should be sent to:

David Jones
District Manager
Bureau of Land Management
Medford District Office
3040 Biddle Road
Medford, OR 97504

The final decisions will be based on the analysis contained in the EIS, any additional data available, public input, management feasibility, policy, and legal constraints. Approval of the plan will be documented in a Record of Decision (ROD) which will be made available to the public and mailed to all parties who were mailed a copy of this document. It is also important to note that RMP implementation usually involves further analysis and decision making, including public involvement, and allows for appeal of adverse decisions under 43 CFR Parts 4 and 5000.

Protest Procedures

The resource management planning process includes an opportunity for administrative review of proposed decisions via a plan protest to the BLM Director if you believe the approval of a proposed RMP would be in error (under CFR 1610.5-2). Careful adherence to these guidelines will assist in preparing a protest that will assure the greatest consideration to your point of view.

Only those persons or organizations who participated in our planning process leading to this Proposed RMP may protest. If our records do not indicate that you had any involvement in any stage in the preparation of the Medford District Proposed RMP, your protest will be dismissed without further review. A protest must also be limited to a single Proposed RMP, even if the issue or concern involves more than one Proposed RMP. Protests that challenge proposed decisions in more than one Proposed RMP will not be accepted by the Director. In effect, if you may be adversely affected by more than one Proposed RMP, you must file an individual protest for each Proposed RMP, citing why and where that particular Proposed RMP is incorrect or not in compliance with existing laws, regulations, etc.

A protesting party may raise only those issues which he or she submitted for the record during the planning process. New issues raised in the comment/protest period should be directed to the Medford District Manager for consideration in plan implementation, as potential plan amendments, or as otherwise appropriate. If an issue is shared by several individuals or landowners or interest groups, a combined protest on the common neighborhood issue or concern may be mutually more efficient and effective. For example, several landowners in a portion of the planning area may wish to combine their concerns on a proposed land allocation or management issue that affects their common interests in a given watershed.

Protests of proposed plan elements that merely adopt decisions made in the *Record of Decision for Amendments to Forest Service and Bureau of Land Management Planning Documents Within the Range of the Northern Spotted Owl and Standards and*

Guidelines for Management of Habitat for Late-Successional and Old growth Forest Related Species Within the Range of the Northern Spotted Owl signed by the Secretary of the Interior will be dismissed, as the Director has no authority to overrule those decisions.

The period for filing a plan protest begins when the Environmental Protection Agency publishes its Notice of Availability for the Medford District's PRMP/FEIS in the Federal Register. The protest period extends for 30 days. There is no provision in BLM's regulations for any extension of time. To be considered "timely," your protest must be postmarked no later than the last day of the protest period. Also, although not a requirement, we suggest that you send your protest by certified mail, return receipt requested. Protest must be filed in writing to:

> Bureau of Land Management
> Division of Planning and Environmental
> Coordination (WO-760)
> 1849 "C" Street, NW
> (406 "L" Street)
> Washington, DC 20240

In order to be considered complete, your protest must contain, at a minimum, the following information.

(1) The name, mailing address, telephone number, and interest of the person filing the protest.

(2) A statement of the issue or issues being protested.

(3) A statement of the part or parts of the proposed RMP being protested. To the extent possible, this should be done by reference to specific pages, paragraphs, sections, tables, maps, etc., included in the document.

(4) A copy of all documents addressing the issue or issues that you submitted during the planning process or a reference to the date the issue or issues were discussed by you for the record.

(5) A concise statement explaining why the BLM State Director's decision is believed to be incorrect. This is a critical part of your protest. Take care to document all relevant facts. As much as possible, reference or cite the planning documents, environmental analysis documents, available planning records, (i.e., meeting minutes or summaries, correspondence, etc.). A protest which merely expresses disagreement with the Oregon/Washington State Director's proposed decision, without any data will not provide us with the benefit of your information and insight. In this case, the Director's review will be based on the existing analysis and supporting data.

Consistency Review

Prior to approval of the RMP, the State Director will submit this plan to the Governor of the State of Oregon and request the Governor to identify any known inconsistencies with the state or local plans, policies, or programs. The Governor will have 60 days to identify inconsistencies and provide recommendations in writing to the State Director.

The consistency of this plan with the resource related plans, programs, and policies of other federal agencies, state and local government and Indian tribes will be reevaluated in the future as part of the formal monitoring and periodic evaluations of the plan.

Public Involvement Prior to the Draft RMP/EIS

Public involvement has been an integral part of the BLM's resource management planning (RMP) process. Public involvement activities have included a series of information mailers or brochures, public meetings, open houses, field trips, distribution of planning documents, document review and comment periods, informal contacts, group meetings, and written letters and responses to comments. Public involvement efforts began in May 1986, when the BLM Oregon State Director sent a mailer to the public entitled, "Public Involvement Planning for the 90s". The mailer asked for comments on the type of public involvement activities that should be conducted in the planning process.

In September 1986, Medford District Office sent a mailer, "Planning for the Public Lands in the Medford District". It outlined the overall planning schedule and requested comments on the first major planning step: issue identification. BLM invited the public to identify issues or concerns they believed should be addressed in the RMP. During this planning step the district hosted ten open houses to acquaint citizens with the planning process and schedule and to discuss issues related to the planning process. The open houses were attended by 161 people and produced comments from 73 individuals.

In response to the mailer and open houses an additional 253 commentors identified concerns. Of these, all but a few originated in western Oregon. Overall, the district interdisciplinary RMP team analyzed 1,488 concerns identified by the public.

Building on public comments received during the issue identification step, BLM prepared another district mailer, "Planning for the Public Lands in the Medford District: Issues and Concerns Summary". Distributed in March 1987, it summarized BLM-identified issues to be analyzed in the RMP and concerns which may be addressed. The public was asked to review those issues and possible concerns and provide comments. The mailer also addressed the second and third planning steps: development of planning criteria including State Director Guidance and collection of inventory data. The mailer disclosed a proposed element of planning criteria by identifying a proposed timber harvest computer model and an opportunity for public comment on that model. The district hosted two technical workshops on timber production capability classification (TPCC) and the operations inventory (OI) in the Medford District Office in May 1987.

In August 1987, the BLM State Director distributed another mailer, "Planning for the Public Lands in Western Oregon: Proposed State Director Guidance Topics", dealing with planning criteria and proposed State Director guidance. This mailer requested comments on relevant topics for Oregon State Office (OSO) guidance and included a schedule for public demonstration of the proposed timber harvest computer model. Demonstrations were conducted in Roseburg and Portland in September 1987. The sessions included comparison and discussion of other harvest models with TRIM-PLUS and a demonstration of how the model works.

In January 1988, a mailer was distributed to inform the public of the upcoming availability of the State Director Guidance document. The draft, "Planning for the Public Lands in Western Oregon: Proposed State Director Guidance", was mailed to all those who requested copies. Additional copies were available in all district offices. Proposed revisions to some elements of that guidance were shared with the respondents for further comment in several letters during 1988, 1989, and 1990.

A Dear Concerned Citizen Letter from the BLM State Director was mailed to the public in May 1988. The letter contained BLM's responses to public comments on alternatives requested by the August 1987 mailer.

A Dear Concerned Citizen Letter from the BLM State Director was mailed to the public in April 1989. This letter contained revisions of proposed State Director Guidance on the formulation of alternatives and analytical techniques to estimate the effects of alternatives. It also contained BLM responses to public comments on previous BLM guidance documents and letters on alternatives and analytical techniques.

A Dear Concerned Citizen Letter from the BLM State Director was sent to the public in March 1990. This letter contained a refinement of State Director Guidance for assessing effects on biological diversity and effects on soil productivity. It also contained BLM responses to public comments on proposed techniques to analyze soil productivity.

A Dear Concerned Citizen Letter from the BLM State Director on the proposed guidance for formulation of RMP alternatives was mailed to the public in June 1990. The letter included BLM responses to the comments received on the April 1989 draft of proposed guidance on alternatives.

The Medford District "Summary of the Analysis of the Management Situation" was published in February 1991. Open houses to gather public comments on the AMS Summary were held in Ashland, Butte Falls, Grants Pass, Medford, Ruch, Williams, and Glendale. These open houses were attended by approximately 220 people. Over 330 letters resulted in about 1,400 comments that were used to further refine the alternatives, including the preferred alternative. All but 11 letters came from within the Medford District. Following publication of the AMS Summary, two Medford District newsletters were mailed to those interested in the planning effort to keep them informed of the progress to prepare the Draft RMP/EIS. Additional information concerning public involvement in the identification of issues addressed in the RMP process is presented in Appendix A.

A Dear Concerned Citizen letter from the BLM State Director on guidance for formulation of the alternatives was mailed to the public July 30, 1991. It included revised guidance on analytical techniques; use of the completed plan; consistency with natural resource related plans, programs, or policies of other agencies; and BLM responses to the comments received on these sections.

Public Involvement Following Publication of the Draft RMP/EIS

Public Involvement Conducted by Oregon State Office

There were a number of formal briefings of non-BLM groups and individuals, as well as informal meetings that covered all six western Oregon Draft RMPs. These meetings and briefings usually were coordinated by the BLM's Oregon State Office, although the formal briefings were led by the former Eugene District Manager. A list of those formal briefings follows:

07/20/92	U.S. Fish and Wildlife Service, Portland
08/06-13\92	U.S. Forest Service, Washington D.C.
	Senator Bob Packwood
	Senator Mark Hatfield (staff)
	Congressman Bob Smith
	Congressman Peter Defazio (staff)
	Congressman Kopetski
	Congressman Norm Dix
	Senator Slade Gordon (staff)
	Congressman Ron Wyden
	BLM Washington Office Staff
	Assistant Secretary of the Interior and Staff
	Professional/Conservation Groups, Washington D.C.
	House Interior Appropriations Staff
	Senate Interior Appropriations Staff
08/19/92	O&C Counties Executive Board
08/20/92	Environmental Groups (Oregon)
	Industry Association (Oregon)
08/28/92	District Advisory Council
09/08/92	Governor's Forest Planning Team
09/16/92	Scientific Review Panel
09/17/92	Willamette Timbermen
09/22/92	Lane County Tax Equalization Group
10/06/92	U.S. Forest Service, Willamette National Forest
10/08/92	Oregon State University Faculty
10/09/92	Willamette Forestry Council
10/21/92	Society of American Foresters, Portland
10/26/92	Society of American Foresters, Eugene
10/27/92	University of Oregon Faculty
11/02/92	University of Washington Faculty
11/10/92	Society of American Foresters, Roseburg

Public Involvement Conducted by Medford District

The Medford District Draft RMP/EIS was released for public review on August 21, 1992. The Federal Register Notice was printed on August 28, 1992 (Vol. 57, No. 168, pg. 39199).

As part of its planning process, the Medford District solicited public comments on its Draft RMP/EIS. Based on comments received the BLM made changes to its Draft RMP/EIS to come up with the Proposed Resource Management Plan/Final Environmental Impact Statement (PRMP/FEIS).

During the 120-day comment period, which extended from August 21 to December 21, 1992, the district received 1,446 comment letters. The district continued to accept comment letters well past the official closing date of the comment period. All of the original letters are on file at the Medford District Office and are available for public review.

The district received comments through individual letters, personal contacts, petitions, and public meetings. The comments received were analyzed so that meaningful changes could be made to the Preferred Alternative (PA) and in the development of the PRMP/FEIS. Substantive comments are the most useful to the BLM in development of the Proposed RMP, although all comments are considered. Substantive comments are those that indicate:

- errors in analysis that has been performed,
- new information that would have a bearing on the analysis,
- misinformation that may have been utilized and could have affect outcome of analysis,
- requests for clarification, and
- support of an existing alternative or definition of a substantive new alternative within the range of alternatives considered.

Each comment is valuable whether "substantive" or not; opinion, feelings, suggestions, and observations were all considered. Use of public comments is not a vote-counting process. Each comment was weighed on its own merit against legal guidelines or mandates, technical information, resource capability, and public opinion.

The National Environmental Policy Act of 1976 requires BLM to respond to substantive comments received during the comment period. Responses to the substantive comments are located in Appendix V.

Comment letters received from federal agencies and elected officials are reproduced in Appendix W.

Public Meetings

The Medford District had seven open houses to disperse information, answer questions, and solicit input regarding the Draft RMP/EIS. The open houses were attended by approximately 176 people and produced over 50 comments. In addition, several other meetings and discussions were held with interested people, groups, and organizations, as requested. The following lists the date and name of the interest group meetings and open houses with whom BLM staffers met to discuss the Draft RMP/EIS.

09/03/92	Medford Advisory Council
09/08/92	Governor's Planning Team Western Oregon
09/21/92	Crater Lake National Park Service Siskiyou National Forest U.S. Army Corps of Engineers, Lost Creek Lake Oregon Game & Fish Oregon Department of Geology & Mineral Industries
09/24/92	Public Lands Foundation
09/29/92	Open House - Medford
09/30/93	Southwest Mining Association
10/05/92	Jackson County Planning Commission
10/06/92	Open House - Grants Pass
10/07/92	Open House - Cave Junction
10/08/92	Open House - Williams
10/14/92	Motorcycle Riders Association
10/16/92	Josephine County Planning Commission
10/21/92	Open House - Wolf Creek
10/23/92	Medford Advisory Council
10/28/92	Open House - Glendale
10/29/82	Southern Oregon Timber Industry Association
10/30/92	Multiple Use Trails Coalition
11/02/92	Nordic Ski Club
11/03/92	Prospect Lions Club
11/04/92	Open House - Butte Falls
11/05/92	Friends of Greensprings
11/06/92	Medford Advisory Council Medford Rotary
11/10/92	Society of American Foresters
11/12/92	Rogue River National Forest
11/13/92	Sierra Club
11/16/92	Motorcycle Riders Association
11/19/92	Native Plant Society
11/20/92	Medford Advisory Council
12/11/92	Medford Advisory Council
01/19/93	Coalition of Equestrian Clubs

Public Input Analysis

Demographics

The district received 1,446 letters: 487 individual letters, 7 petitions, 2 resolutions, and 834 form letters (see Figure 5-1) with a total of 2,150 signatures (see Figure 5-2). Most letters had more than one comment and there were 7,216 separate comments. Of the 7,216 comments, approximately 3,071 were substantive comments and 4,145 were preference/opinion comments.

The district received letters from six states: California 24, Hawaii 4, New Mexico 3, Texas 1, Washington 9, and Oregon 1,289 (see Figure 5-3).

Of the 1,446 letters received, 1,330 letters were recorded into a data base computer program. Some letters did not include names, addresses and/or signatures, or the names, addresses and/or signatures were not legible. Therefore the district did not record these letters into the computer program, however, they were read and the comments considered.

Form letters made up 59 percent of the total letters received. Seven different form letters were received by the district: two from Headwaters, Inc., two from off-highway vehicle groups, one from Southern Oregon Timber Industry Association, one from Talent Watershed Intercommunity Group, and one from Rockydale.

The following list tabulates the number of comments according to major topics or resource elements addressed in the comment letters:

Topics	Number of Comments
Climate	3
Air Resources	14
Soils	36
Water Resources	330
Vegetation	24
Timber Resources	885
Wildlife	55
Birds	8
Fish	131
Special Status Species	507
Biological Diversity	492
Cultural Resources	5
Special Areas	238
Recreation	558
Visual Resources	35
Wild & Scenic Rivers	91

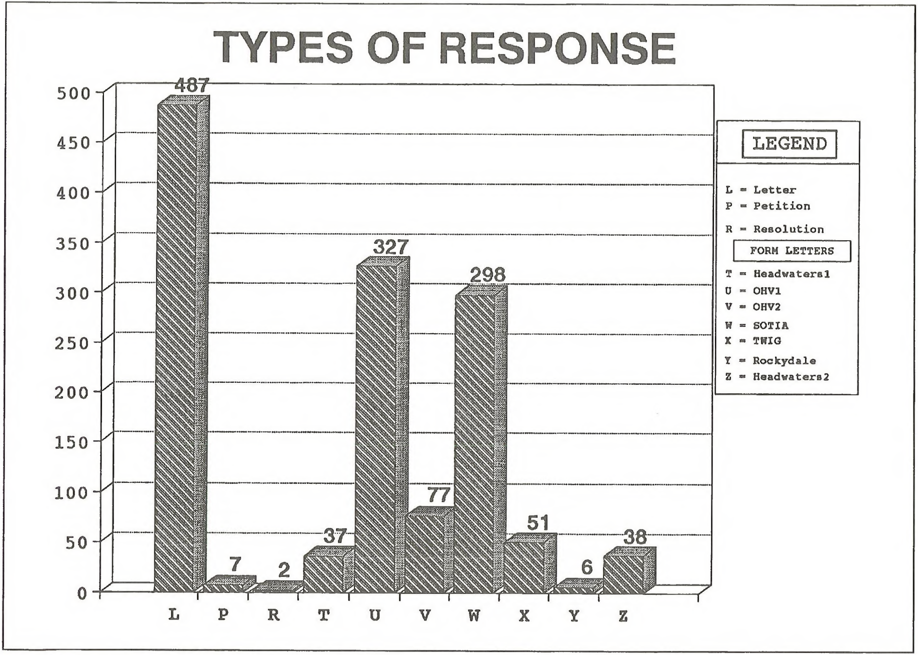


Figure 5-1. Types of Response

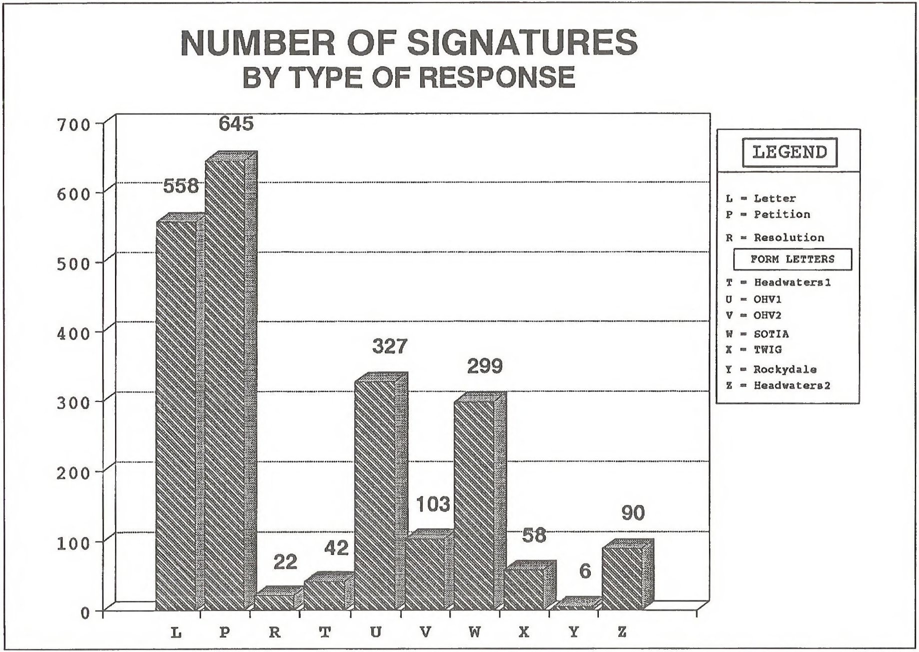


Figure 5-2. Number of Signatures

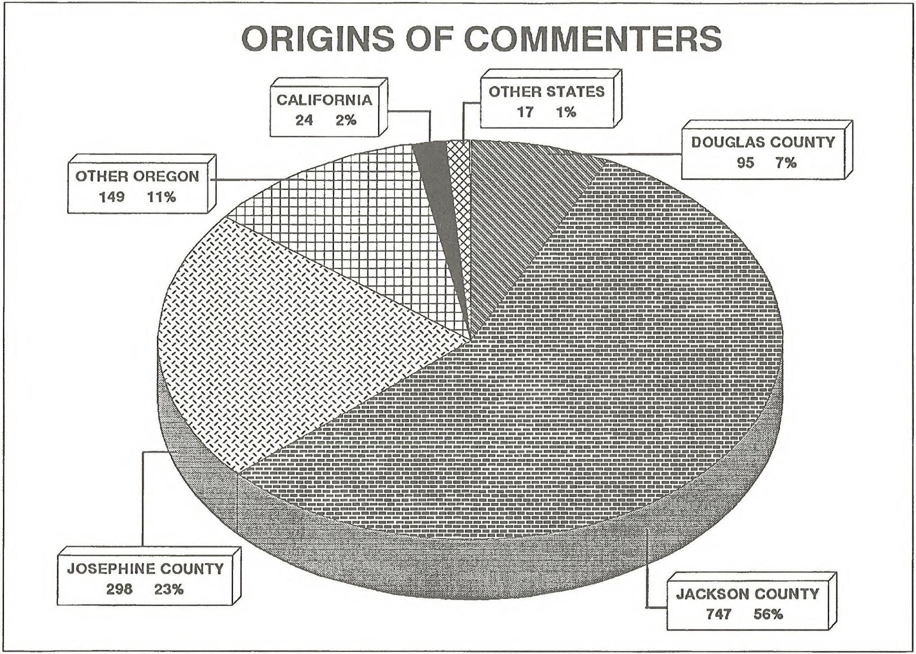


Figure 5-3. Origins of Commenters

Wilderness	22
Energy & Minerals	73
Lands/Rights-of-way	28
Roads	153
Access	2
Fire	63
Socioeconomics	1,020
Rural Interface Areas	121
Riparian Resources	612
Grazing	33
Impact Analysis	68
Planning	132
General Management	54
Legal Requirements	812
Issues	7
Alternatives*	487
Miscellaneous	117
Total	7,217

*In many cases, the Preferred Alternative comments in the Draft RMP also addressed specific resource elements.

Comment Analysis Process

Each comment letter received a date stamp and an identification number.

All letters were read first for information that needed immediate attention. Those deemed as needing immediate attention were copied and routed to appropriate personnel. All letters were routed to each manager. Whether or not the letters needed immediate attention, all letters received a second screening to record demographics and the substantive and preference/opinion comments.

The westside Districts were required by State Director Guidance to record demographics. This included the name, organizational title, address, type of respondent, type of response, and number of signatures from each letter received. However, the Districts had the option to capture and record verbatim substantive and preference/opinion comments. The Medford District elected to do this step. The RMP Comment Coding Team read every letter received to identify the issues and reasons behind the comments/preferences/opinions. Each comment was assigned a corresponding code that reflected the issues, opinions, and reasons stated.

The comments were entered into a computer database program. This provided reports such as number of comments by topic, summary of types of responses, number of signatures by type of response, and list of respondents and verbatim comments recorded.

In April 1993, Medford District Office sent an RMP Information Newsletter, "Planning for the 1990s." It outlined public input analysis, the number of comments captured according to major topics or resource elements, and summarized comment analysis.

Summary of Public Comments on the Draft SEIS

The following is a brief summary of the public comments and analysis for the *Draft Supplemental Environmental Impact Statement on Management of Habitat for Late-Successional and Old Growth Forest Related Species Within the Range of the Northern Spotted Owl.* A detailed description of the public comments and analysis can be found in the final supplemental environmental impact statement released in February 1994.

The Bureau of Land Management was invited to comment on the draft supplemental environmental impact statement along with other state and federal agencies, interest groups, and the public. Public hearings were also held in Oregon, Washington, and California; these hearings received testimony or written comments from 359 individuals. The BLM participated in the coordination of these hearings.

During the 90-day comment period, 101,894 letters were received from all 50 states and several foreign countries. Approximately 40 percent of the letters came from east of the Mississippi River, indicating that this issue extends beyond the three states effected.

The subjects that received the most substantive comments included: allocations 17.7 percent, ecosystem 15.2 percent, silviculture 9.8 percent, and economic effects 7.7 percent. Comments related to BLM's draft resource management plans were 0.1 percent (see Table 5-1).

The comments indicate that feelings and issues surrounding the management of the national forests and BLM-administered lands in Oregon, Washington, and California remain intense and polarized.

Table 5-1. Comments on Draft SEIS, Totals by Affiliation and Response Type

Affiliation	Response Type				Total by Affiliation
	Letters	Forms	Petitions	Hearings	
Elected officials from Washington, Oregon, California	7	0	0	5	12
Federal agencies	14	0	0	0	14
State, county, and city governments	29	0	3	18	50
Businesses	88	0	0	16	104
Interest groups	238	0	2	106	346
American indian tribes and nations	13	0	0	0	13
Libraries, schools, and universities	11	0	1	3	15
Individuals	10,093	91,004	32	211	101,340
Total by Response Type	10,493	91,004	38	359	101,894

List of Agencies and Organizations Contacted and to Whom Copies of the Proposed RMP/Final EIS Have Been Sent

The RMP Team or supporting individuals in the Oregon State Office contacted or received input from the following organizations during development of the Proposed RMP/FEIS. Copies of the Proposed RMP/FEIS have been sent to these agencies/groups/organization/corporations, along with a large number of individuals.

State of Oregon Agencies

FERC-Division of Environmental Analysis
Governor's Office of Oregon
Josephine County Forestry Department
Oregon Department of Agriculture
Oregon Department of Environmental Quality
Oregon Department of Fish and Wildlife
Oregon Forestry Department
Oregon Department of Geology and Mineral Industries
Oregon Department of Geology and Minerals
Oregon Department of Land Conservation
Oregon Division of State Lands
Oregon Department of Transportation-Environmental Section
Oregon Economic Development Department
Oregon Environmental Council
Oregon Equestrian Trails
Oregon Extension Office
Oregon Farm Bureau Federation
Oregon Forest Industries
Oregon Forest Products Transport Association
Oregon Governor's Forest Planning Team
Oregon Guides and Packers
Oregon High Desert Museum
Oregon Historical Society
Oregon House of Representatives
Oregon Hunters Association
Oregon Institute of Technology
Oregon Kayak and Canoe Club
Oregon Logging Conference
Oregon Natural Heritage Database
Oregon Natural Resources Council
Oregon River Outfitters
Oregon Secretary of State
Oregon Sheep Growers
Oregon Shores Conservation Coalition
Oregon State Employment Office
Oregon State Highway Division
Oregon State Historic Preservation Officer
Oregon State Marine Board
Oregon State Parks and Recreation
Oregon State Scenic Waterways
Oregon State Senate
Oregon State Snowmobile Association
Oregon Trout
Oregon State Department of Water Resources
Oregon Wildlife Federation
Oregon Women for timber
Oregon State University
U.S. Army Corps of Engineers
U.S. Nickel Corporation
U.A. Air Force
U.S.D.A. Forest Service
U.S.D.I. Bureau of Mines
U.S.D.I. Mineral Management Service
U.S.D.I. National Park Service
U.S.D.I. Fish & Wildlife Service
U.S.D.I. Bureau of Reclamation

Local Government and other Government Bodies

Applegate Public Library
Council of Government, Oregon District 4
Curry County Board of Commissioners
Douglas County Board of Commissioners
Douglas County Planning Commission
Environmental Protection Agency-Region 10
Federal Highway Administration
Humbolt State University
Illinois Valley Chamber of Commerce
Jackson County Board of Commissioners
Jackson County Chamber of Commerce
Jackson County Planning Commission
Josephine County Board of Commissioners
Josephine County Planning Office
Klamath County Board of Commissioners
Klamath County Planning Department
Klamath-Lake Planning & Coordination
Medford District Advisory Council
Oregon Department of Forestry, Ashland
Oregon Department of Forestry, Grants Pass
Oregon State Library
Portland State University Library
Rogue Valley Council of Governments
Southern Oregon State College
The Dome School
Town of Butte Falls

Umpqua Regional Council of Governments
U.S.D.I. Bureau of Indian Affairs, Portland Office

Organizations

1000 Friends of Oregon
Advisory Council on Historic Places
AFL-CIO of Oregon
American Fisheries Society, Oregon Chapter
American Forest Council
American Mining Congress
American Rivers
American Society of Landscape Architects
Arabian Horse Association of Southern Oregon
Armadillo Mining Shop
Association of Oregon Counties
Associated Oregon Industries
Associated Oregon Loggers
Association of Northwest Steelheaders
Association of O&C Counties
Butte Falls Economic Development Committee
Butte Falls Forest Advocates
Byrd Mining
Waldo Mining
Cal-Ore Appaloosa Horse Club
California Fish and Game Department
California Nickel Group
Cathedral Hills Dressage & Eventing Club
Charley Livestock Company
Citizen Advisory Committee
Citizens for Sensible Timber Harvest
Citizens Natural Resource Group
Coalition of Equestrian Clubs
College of the Siskiyous
Columbia River Intertribal Fish Commission
Community Relation Associates Inc.
Cow Creek Band of the Umpqua Tribe
Deer Creek Valley Natural Resources Conservation
Defenders of Wildlife
Double Dee Lumber Company
Douglas Timber Operators
Earth First Siskiyou
Eastern Oregon Mining Association
Easy Gaited Club
Echo River Trips
Environmental & Natural Resources Division
Fall Creek Ranch
Fir Springs Tree Farm
Forest Conservation Council
Forest Farm Association
Giustina Resources
Habitat Creations
Headwaters
Helicopter Loggers Association
Howard Prairie Resort
Hyatt Lake Homeowners Association
Illinois Valley Soil & Water Conservation District
Izaak Walton League
Jackson County Stockmen's Association
Jackson County Citizens League
Jackson County Soil & Water Conservation District
James Henry River Journeys
Jefferson State Tennessee Walking Horse Club
Josephine County Sportsmens Association
Josephine County Soil & Water Conservation District
King Mountain Advocacy
Klamath Basin Horsemans Club
Klamath Forest Alliance
Klamath Soil & Water Conservation District
Klamath Tribe
Licen (Environmental Sanctuary)
Madroak Logging
Mardale Ranch
Marmalade Farm
Mazamas
Meadows Trust
Middle Rogue Chapter of Northwest Steelheaders
Minerals Exploration Coalition
Morgan Springs Estate
Motorcycle Riders Association
Multiple Use Coalition for Trails
National Marine Fisheries Service
National Public Lands Advisory Council
Native Plant Society
Natural Resources Defense Council Inc.
Nature Conservancy, The
New Age Mission Inc.
North Applegate Watershed Protection Association
Northwest Drifters
Northwest Environmental Defense Center
Northwest Forestry Association
Northwest Mineral Prospectors Club
Northwest Mining Association
Northwest Petroleum Association
Northwest Power Planning Council
Northwest Whitewater Excursions
Northwestern University
Northwest Coalition for alternatives to Pesticides
Office of Regional Solicitor
Oregon Archeological Society
Oregon Beef Council
Oregon Council of Gems & Minerals
Pacific Crest Outward Bound
Pacific Crest Trail Conference
Pacific Northwest 4WD Association
Pacific Northwest Forest & Range Experiment Station
Pacific Power and Light
Pacific Rivers Council
Pittsburg & Midway Mining Company, Land Department
Plattsburgh State University of New York
Public Forestry Foundation
River Trips Unlimited

Rockinghorse Ranch
Rockydale Neighborhood Association
Rogue Canyon Guide Service
Rogue Flyfishers
Rogue Gem and Geology Club
Rogue River Guides Association
Rogue River Raft Trips
Rogue Valley Dressage and Eventing Club
Rogue Valley Hand Gliding Association
Rogue Valley Hispanic Coalition
Roxy Anne Gem and Mineral Club
Roxy Anne Grange - 792
Save Our Klamath River
Selma Citizens Advocating Responsible Forestry
Shasta Nation
Sierra Club
Sierra Whitewater Expeditions
Siskiyou Chapter
Siskiyou Regional Education Project
Society of American Foresters
Soda Mountain Resource Council
Soil Conservation Service
Southern Oregon Coalition Against Pesticides
Southern Oregon Timber Industry Association
South Douglas Soil & Water Conservation District
Southern Oregon Agricultural Experiment Station
Southern Oregon Cutting Association
Southern Oregon Nordic Ski Club
Southern Oregon Resources Alliance
Southern Oregon Saddlebred Enthusiasts
Southwestern Oregon Miners Association
Spalding & Son Inc.
State of Jefferson Quarter Horse Club
Stone Forest Industries Inc.
Straus Ranches
Takilma Community Association
Talent Watershed Intercommunity Group
Taylor Logging
Tex-Ore Mineral Limited
The Pacific Rivers Council
Threatened & Endangered Little Applegate Valley
Trout Unlimited
Umpqua Fishermans Association
Umpqua Watersheds
Upper Rogue Regional Tourism Alliance
Utah International
Washington State Mineral Council
Western American Manufactures Inc.
Western Council Lumber Products & Industrial Workers
Wester Forest Industries Association
Western Forestry and Conservation
Western Interstate Energy Board
Western Mining council Inc.
Western Oil and Gas
Western State Legislators Forestry Task Force
Western Utility Group
Wild Horse Organized Assistance
Wilderness Society
Wilderness Waterways
Wildlife Management Institute
Wildlife Society, Oregon Chapter
Willamette Timbermens Association Inc.
Williams Watershed Protection Association
Wilson Forests
Wolf Creek Trails

Corporations

AMOCO Minerals Company
ANA-Lab Corporation
Anaconda Cooper Company
Boise Cascade
Burrill Lumber Company
C&D Lumber Company
Cannel Corporation
Cascade Wood Products
Chiloquin Forest Products
Columbia Plywood Corporation
Cominco American Inc.
Corex Exploration Company
Cornett Lumber Company
Croman Corporation
Darnell Design
Darnoc Consulting
DR Johnson Lumber Company
E-B Natural Resources Management Corporation
Estremado & Estremado Inc.
Georgia Pacific Corporation]
Golden Light Enterprise Inc.
Homestake Mining Company
Landau Associates Inc.
Mason Bruce & Girard Inc.
Maxi Mill Inc.
Medford Corporation
Mobil Oil Corporation
Modoc Lumber Company
Mountain Fir Lumber Company
Roseburg Lumber Company
Rough and Ready Lumber Company
Royal Oak Enterprises Inc.
Superior Lumber Company Inc.
Timber Products Company
Weyerhaeuser
Weyerhaeuser Company

Federal Agencies

U.S.D.A. Forest Service
U.S.D.I. Bureau of Mines-Western Field Operations Center
U.S.D.I. Fish and Wildlife Service
U.S.D.I. Minerals Management Service
U.S.D.I. National Park Service
U.S.D.A. Bonneville Power Administration
U.S. Environmental Protection Agency

List of Preparers

BLM Management

Name	Responsibilities/Positions	Qualifications
David A. Jones	Management Guidance/Medford District Manager	B.S., Forestry & Range Management, Colorado State University. BLM, 31 years.
Richard Drehobl	Management Guidance/Ashland Area Manager	B.S., Forestry, Range Management & Outdoor Recreation Planning, University of Arizona. BLM, 21 years.
Robert C. Korfhage	Management Guidance/Glendale Area Manager	B.S., Range Management, Washington State University; M.S., Range/Wildlife Habitat Management, Washington State University. BLM, 23 years.
Gretchen Lloyd	Management Guidance/Grants Pass Area Manager (former RMP Leader)	Environmental Science, University of Virginia. USFS, 3 years; BLM, 17 years.
Lance Nimmo	Management Guidance/Butte Falls Area Manager	B.S., Forest Management, University of Montana. BLM, 26 years.

RMP Team

Steve Armitage	Timber Sale Planning, Implementation & Monitoring, 10-year Timber Scenario District Lead/Forest Manager	B.S., Forest Management, University of Michigan. USFS, 3 years; BLM, 23 years.
Nabil Atalla	Forest Health Coordinator/ Natural Resources Specialist	Ph.D., Plant Pathology, Rutgers University, Research 7 years. BLM, 15 years.
Cori Backen	Writer-Editor	A.S., Administrative Office Management; Business Education, Southern Oregon State College, 4 years. Private industry, 3 years; BLM, 5 years.
Bob Bessey	Fisheries, Streams, Riparian/ Fisheries Biologist	M.S., Fisheries, University of Washington. Private industry, 4 years; BLM, 18 years.
Charlie Boyer	Monitoring Plan Preparation/ Natural Resource Specialist	B.S., Forestry (Range Management), University of Idaho. USDA-ARS, 1 year; BLM, 21 years.
Jim Brimble	Co-author and Analyzed Timber, Vegetation, & Biological Diversity/Forester	B.S., Forest Management, Texas A&M University; Graduate Forestry work, Texas A&M University, University of Washington, Oregon State University. BLM, 15 years.
Robert Budesa	Livestock Grazing/Range Conservationist	B.S., Animal Science, Chico State University. USFS, 1 year; BLM, 20 years.

Gerard Capps	Energy & Minerals/Geologist	B.S., Geology, University of California. Exploration geologist, 4 years; BLM, 16 years.
Greg Chandler	Public Comment Analysis/ Environmental Coordinator	B.S., M.S., Forestry, Southern Illinois University. BLM, 16 years.
Scott Haupt	TRIM-PLUS Team Member/Forester	B.S., Forestry, Texas A&M; M.F., Forestry, Penn State; Silviculture Institute, Oregon State University. BIA, 12 years; BLM, 5 years.
Tom Jacobs	Rangeland Management/Range Conservationist	B.S., Range Conservation, Washington State University; Graduate Study, Rangeland Ecology, Washington State University. BLM, 21 years.
Dale Johnson	District Fisheries Biologist – Fisheries	B.S., Fisheries Science, Oregon State University; Beak Environmental Consulting, 3 years; EPA, 1 year; Bonneville Power Administration, 10 years; BLM, 6 years
Jim Keeton	RMP Team Leader & Technical Coordinator/Environmental Protection Specialist	B.A., Geography; M.S., Outdoor Recreation Management, Southern Illinois University. BLM, 20 years.
Laurie Lindell	Water Resources, Water Quality & Riparian Zones/Hydrologist	M.S., Water Resources, Colorado State University. Research, 1 year; BLM, 15 years.
Pete Littlefield	Public Involvement Analysis, CFI Inventory Quality Control, MicroStorms Data Generation, PSQ (TRIM-PLUS Simulations)/Computer Assistant	BLM, 8 years.
Robert Marlow	Forest Inventory, PSQ Determination, and Acreage Data Computation/District Forest Inventory Specialist	B.S., Forest Management, Southern Illinois University. BLM, 23 years.
Jim McConnell	Technical Coordinator PRMP/ Public Comment Analysis/ Environmental Coordinator	B.S., Forest Management, Colorado State University. USFS, 4 years. BLM, 15 years.
Jan Miller	Lands & Rights-of-Way/Chief Lands and Minerals	B.S., Forest Management, University of of Minnesota. BLM, 27 years.
Robert Pierle	Growth and Yield Projections and Tabular Information for Timber/Silvicultural Assistant	B.S., Forestry and Recreation, Purdue University. USFS, 1 year. BLM, 15 years.
Rick Prusz	District Coordinator Automated Resources Data (ARD) & Geographic Information Systems (GIS)/Natural Resource Specialist	B.S., Forest Management, University of Illinois; M.S., Forest Resources, University of Illinois. BLM, 21 years.
Jim Russell	Fire & Fuels Management & Air Quality/ District Fire Management Officer	B.S., Biological Science, Chico State University; M.S., Forest Fire Science and Technology, University of Washington; Forestry Credit, Humboldt State University. USFS, 16 years; BLM, 7 years.

Roger Schnoes	Wildlife & Special Status Species/ Wildlife Biologist	B.S., Wildlife Biology, University of Minnesota; M.S., Forest Management, Oregon State University; State Universities, 2 years. BLM, 14 years.
Joan Seevers	Special Areas, Special Status Species, Vegetation, and Biological Diversity/District Botanist	B.S., General Studies, Southern Oregon State College. BLM, 17 years.
Thomas Sensenig	TRIM-PLUS Team Member/ Silviculturist	B.S., Resource Management, West Virginia University; Graduate studies in Ecology, Southern Oregon State College, 2 years; M.F.R., Silviculture, University of Washington; Silviculture Institute, Oregon State University. BLM, 14 years.
Steve Shade	Soil Resources/Supervisory Natural Resource Specialist	B.S., Forest Management, minor in soil science, Washington State University; Graduate studies in soil science, Cornell University. Jackson County, 2 years; SCS, 3.5 years; USFS, 3 years; private industry, 5 years; BLM, 19 years.
Brad Sheehan	Public Comment Analysis/Forester	B.S., Forest Management, West Virginia University. M.S., Business Administration, Southern Oregon State College. BLM, 17 years.
Peggy Staniford	Document Production/Office Automation Assistant	Secretarial Sciences, Salem Technical Vocational College; Psychology, Chemeketa Community College. Southern Oregon State College; Horticulture, Business Administration. Polk County, 6 years; BLM, 4 years.
Fred Tomlins	Wild and Scenic Rivers/Outdoor Recreation Planner	B.S., Business Administration, University of California at Berkeley: M.S., Wildland Recreation Management, University of Idaho. BLM, 16 years.
Mike Walker	Rural Interface Areas/Outdoor Recreation Planner	B.S., Natural Resources; M.S., Resource Geography, Oregon State University. County government, 3 years; BLM, 24 years.
Jean Williams	Public Comment Analysis/ Environmental Coordinator	B.S., Environmental Interpretation/Education, Oregon State University. USDA, Forest Service, 13 years; BLM, 3 years.
Kate Winthrop	Cultural Resources/ District Archaeologist	M.A., Ancient Studies, University of Minnesota. Contract Archaelogist, 10 years; BLM 3 years.
Larry Zowada	10-year Timber Scenario Team Member/Plans Forester	B.S., Forest Resource Management, University of Idaho. USFS, 2 years; BLM, 18 years.

State Office Support

Dale E. Bays	Timber Supply Analysis/Economist	B.S., Forestry, State University of New York; Graduate studies in Economics, SUNY and Utah State University, 5 years. BLM, 24 years.
Chris Cadwell	Natural Resource Database Specialist	B.S., Forest Management, Humbolt State University. BLM, 14 years.
Duane Dippon	Automated Resource Data/GIS Specialist in Planning	B.S.F., Forest Management, Purdue University, 1975; M.S.F., Forest Management, Purdue University, 1977; and PhD, Forest Economics, Oregon State University, 1991. Associate Professor in Forest Management and Quantitative Methods (including GIS), University of Florida, 1981-1988 and 1989-90. BLM, 6 years.
Leslie Frewing-Runyon	Socioeconomic Conditions/ Economist	B.A., Economics, Willamette University. BLM, 6 years.
Rebecca Gravenmier	GIS Coordination & Development of GIS Computer Programs/Natural Resource Specialist & GIS User Analyst	B.S., Utah State University. BLM, 9 years.
Phil Hamilton	Planning Process Coordinator	B.S., Forestry, State University of New York; Graduate studies in Public Administration and Economics. BLM, 38 years.
Jeffery Nighbert	Senior Technical Specialist for Land Information Systems/ Biological Diversity Team Member, Hexagon Analysis, and GIS Technical Advisor	B.U.S., (specializing in Geography), University of New Mexico; M.A., (Geography, specializing in Methodologies), University of New Mexico. GIS Specialist, 12 years; BLM, 17 years.

Past Team Members

Harold J. Belisle	Management Guidance/Grants Pass Area Manager	B.S., Forestry & Recreation Management, Colorado State University; M.S., Planning and Park Administration, Texas Tech University. BLM, 15 years.
Cassandra Blankenship	Document Production/Computer Assistant	Secretarial Science, International Business College, 1 year. Private Industry, 7 years; DOD, 17 years; BLM, 3 months.
Lewis Brush	Socioeconomic Conditions/Natural Resource Specialist	B.S., Forestry, University of Missouri. USFS, 16 years; BLM, 16 years.
Lyman Deich	Cultural Resources/Archaeologist	B.A., Anthropology, Portland State University; M.A., Anthropology, Portland State University. BLM, 15 years.
Michael Haske	Co-author of Timber and Vegetation/Forester	B.S., Forest Science, University of Illinois. BLM, 11 years.

Jonne Hower	Writer-Editor	B.S., Forestry (Range Management), University of Idaho; M.A., Communications, University of Portland. SCS, 4 years; BLM, 3 years.
Robert Lewis	Timber, Vegetation, Biological Diversity, Old Growth, Ecology Silvicultural Systems, Growth and Yield Modeling, & Habitat Modeling/District Silviculturist	B.S., Forest Science; M.S., Forestry (Silviculture and Ecology), Penn State Issues, University. BLM, 23 years.
Donald Moran	10-year Timber Scenario Team Member/Plans Forester	B.S., Forest Management, Pennsylvania State University. BLM, 30 years.
Kit Mottice	Writer-Editor	B.S., Forest Management Science, Colorado State University. Private Industry, 3 years; BLM, 2 years.
Ron Russell	Recreation, Visual, & Wilderness/ District Landscape Architect	B.S., Landscape Architecture, University of Wisconsin. USFS, 4 years; BLM, 26 years.
Larry Van Ausdall	Roads Management/Chief Branch of Transportation	Business Administration, Southern Oregon State College, 2 years. USFS, 1 year; BLM, 36 years.
Mary Zuschlag	RMP Team Leader	B.S., Resource Management, University of Connecticut. SCS, 2 years; USFS, 2 years; BLM, 11 years.

Glossary of Terms

Activity Plan - A document that describes management objectives, actions, and projects to implement decisions of the RMP or other planning documents. Usually prepared for one or more resources in a specific area.

Adaptive Management Areas - Landscape units designated for development and testing of technical and social approaches to achieve desired ecological, economic, and other social objectives.

Age Class - One of the intervals into which the age range of trees is divided for classification or use.

Airshed - A geographical area that shares the same air mass due to topography, meteorology, and climate.

Allowable Cut Effect - The expected contribution to the PSQ resulting from future management decisions.

Anadromous Fish - Fish that are born and reared in freshwater, move to the ocean to grow and mature, and return to freshwater to reproduce. Salmon, steelhead, and shad are examples.

Analysis of the Management Situation (AMS) - A document that summarizes important information about existing resource conditions, uses, and demands, as well as existing management activities. It provides the baseline for subsequent steps in the planning process, such as the design of alternatives and affected environment.

Analytical Watershed - For planning purposes, a drainage basin subdivision of the planning area used for analyzing cumulative impacts on resources.

Animal Damage - Injuries inflicted upon forest tree seed, seedlings, and young trees through seed foraging, browsing, cutting, rubbing, or trampling; usually by mammals and birds.

Animal Unit Month (AUM) - The amount of forage necessary for the sustenance of one cow or its equivalent for one month.

Aquatic Ecosystem - Any body of water, such as a stream, lake, or estuary, and all organisms and nonliving components within it, functioning as a natural system.

Aquatic Habitat - Habitat that occurs in free water.

Archaeological Site - A geographic locale that contains the material remains of prehistoric and/or historic human activity.

Area of Critical Environmental Concern (ACEC) - An area of BLM-administered lands where special management attention is needed to protect and prevent irreparable damage to important historic, cultural or scenic values, fish and wildlife resources or other natural systems or processes; or to protect life and provide safety from natural hazards (see also Potential ACEC).

Area of Critical Mineral Potential - An area nominated by the public as having mineral resources or potential important to the local, regional, or national economy.

Area Regulation - A method of scheduling timber harvest based on dividing the total acres by an assumed rotation.

Automated Resource Data (ARD) - Computerized map data used for the management of resources.

Available Forestland - That portion of the forested acres for which timber production is planned and included within the acres contributing to the probable sale quantity (PSQ). This includes both lands allocated primarily to timber production and lands on which timber production is a secondary objective.

Back Country Byway - A road segment designated as part of the National Scenic Byway System.

Basal Area - The area of the cross section of a tree stem near its base, generally at breast height, 4.5 feet above the ground and inclusive of bark.

Baseline - The starting point for analysis of environmental consequences; may be the conditions at a point in time (e.g., when inventory data is collected) or may be the average of a set of data collected over a specified period of years.

Basic Resource Unit (BRU) - A term used in TRIM-PLUS for the smallest unit of timberland that has been identified in the inventory.

Basin Programs - Sets of state administrative rules that establish types and amounts of water uses allowed in the state's major river basins and form the basis for issuing water rights.

Beneficial Use - The reasonable use of water for a purpose consistent with the laws and best interest of the peoples of the state. Such uses include, but are not limited to, the following: instream, out of stream and ground water uses, domestic, municipal, industrial water supply, mining, irrigation, livestock watering, fish and aquatic life, wildlife, fishing, water contact recreation, aesthetics and scenic attraction, hydropower, and commercial navigation.

Best Management Practices (BMP) - Methods, measures, or practices designed to prevent or reduce water pollution. Not limited to structural and nonstructural controls, and procedures for operations and maintenance. Usually, BMPs are applied as a system of practices rather than a single practice.

Best Practicable Technology - Current water pollution treatment technology established for water quality limited streams within the constraints imposed by economic factors.

Big Game - Large mammals that are hunted, such as Roosevelt elk, black-tailed deer, and black bear.

Biological Corridor - A habitat band linking areas reserved from substantial disturbance.

Biological Diversity - The variety of life and its processes.

Biological Legacies - Components of the forest stand (e.g., large trees, down logs, and snags) reserved from harvest to maintain site productivity and to provide structure and ecological functions in subsequent forest stands.

Board Foot (BF) - A unit of solid wood, one foot square and one inch thick.

Broadcast Burn - Allowing a prescribed fire to burn over a designated area within well defined boundaries for reduction of fuel hazard or as a silvicultural treatment, or both.

Bureau Assessment Species - Plant and animal species on List 2 of the Oregon Natural Heritage Data Base, or those species on the Oregon List of Sensitive Wildlife Species (OAR 635-100-040), which are identified in BLM Instruction Memo No. OR-91-57, and are not included as federal candidate, state listed, or Bureau-sensitive species.

Bureau-Sensitive Species - Plant or animal species eligible for federal listed, federal candidate, state listed, or state candidate (plant) status, or on List 1 in the Oregon Natural Heritage Data Base, or approved for this category by the State Director.

Candidate Species - Those plants and animals included in Federal Register "Notices of Review" that are being considered by the Fish and Wildlife Service (FWS) for listing as threatened or endangered. There are two categories that are of primary concern to BLM. These are:

> Category 1. Taxa for which the FWS has substantial information on hand to support proposing the species for listing as threatened or endangered. Listing proposals are either being prepared or have been delayed by higher priority listing work.
>
> Category 2. Taxa for which the FWS has information to indicate that listing is possibly appropriate. Additional information is being collected.

Casual Use - Activities ordinarily resulting in negligible disturbance of federal lands and resources.

Cavity Excavator - A wildlife species that digs or chips out cavities in wood to provide a nesting, roosting, or foraging site.

Cavity Nesters - Wildlife species, most frequently birds, that require cavities (holes) in trees for nesting and reproduction.

Characteristic Landscape - The established landscape within an area being viewed. This does not necessarily mean a naturalistic character. It could refer to an agricultural setting, an urban landscape, a primarily natural environment, or a combination of these types.

Class I (air quality) Areas - Special areas (i.e., national parks, certain wilderness areas) protected for their air quality related values.

Clearcut Harvest - A timber harvest method in which all trees are removed in a single entry from a designated area, with the exception of wildlife trees or snags, to create an even-aged stand.

Climax Plant Community - The theoretical, final stable, self-sustaining, and self reproducing state of plant community development that culminates plant succession on any given site. Given a long period of time between disturbances, plant associations on similar sites under similar climatic conditions would approach the same species mixture and structure. Under natural conditions, disturbance events of various intensities and frequencies result in succession usually culminating as sub-climax with the theoretical end point occurring rarely if at all.

Coastal Oregon Productivity Enhancement Program (COPE) - A cooperative research and education program to identify and evaluate existing and new opportunities to enhance long-term productivity and economic/social benefits derived from the forest resources of coastal Oregon.

Commercial Forestland - Land declared suitable for producing timber crops and not withdrawn from timber production for other reasons.

Commercial Thinning - The removal of merchantable trees from an even-aged stand to encourage growth of the remaining trees.

Commercial Tree Species - Conifer species used to calculate the commercial forestland PSQ. They are typically utilized as saw timber and include species such as Douglas-fir, hemlock, spruce, fir, pine, and cedar. (Also see Noncommercial Tree Species.)

Commodity Resources - Goods or products of economic use or value.

Community Stability - The capacity of a community (incorporated town or county) to absorb and cope with change without major hardship to institutions or groups within the community.

Community Water System - See Public Water System.

Concern - A topic of management or public interest that is not well enough defined to become a planning issue, or does not involve controversy or dispute over resource management activities or land use allocations or lend itself to designating land use alternatives. A concern may be addressed in analysis, background documents, or procedures or in a noncontroversial decision.

Congressionally Reserved Areas - Areas that require Congressional enactment for their establishment, such as national parks, wilderness and wild and scenic rivers.

Connectivity - A measure of the extent to which conditions between late-successional/old growth forest areas provide habitat for breeding, feeding, dispersal, and movement of late-successional/old growth-associated wildlife and fish species.

Consistency - Under the Federal Land Policy and Management Act, the adherence of BLM resource management plans to the terms, conditions, and decisions of officially approved and adopted resource related plans, or in their absence, with policies and programs of other federal agencies, state and local governments and Indian tribes, so long as the plans are also consistent with the purposes, policies, and programs of federal laws and regulations applicable to BLM-administered lands. Under the Coastal Zone Management Act, the adherence to approved state management programs to the maximum extent practicable, of federal agency activities affecting the defined coastal zone.

Coos Bay Wagon Road (CBWR) Lands - Public lands granted to the Southern Oregon Company and subsequently reconveyed to the United States.

Core Area - That area of habitat essential in the breeding, nesting, and rearing of young up to the point of dispersal of the young.

Cover - Vegetation used by wildlife for protection from predators, or to mitigate weather conditions, or to reproduce. May also refer to the protection of the soil and the shading provided to herbs and forbs by vegetation.

Critical Habitat - Under the Endangered Species Act, (1) the specific areas within the geographic area occupied by a federally listed species on which are found physical and biological features essential to the conservation of the species, and that may require special management considerations or protection; and (2) specific areas outside the geographic area occupied by a listed species when it is determined that such areas are essential for the conservation of the species.

Crucial Habitat - Habitat that is basic to maintaining viable populations of fish or wildlife during certain seasons of the year or specific reproduction periods.

Cubic Foot - A unit of solid wood, one foot square and one foot thick.

Cull - A tree or log that does not meet merchantable specifications.

Culmination of Mean Annual Increment (CMAI) - The peak of average yearly growth in volume of a forest stand (total volume divided by age of stand).

Cultural Resource - Any definite location of past human activity identifiable through field survey, historical documentation, or oral evidence; includes archaeological or architectural sites, structures, or places, and places of traditional cultural or religious importance to specified groups whether or not represented by physical remains.

Cultural Site - Any location that includes prehistoric and/or historic evidence of human use or that has important sociocultural value.

Cumulative Effect - The impact which results from identified actions when they are added to other past, present, and reasonably foreseeable future actions regardless of who undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period of time.

Debris Torrent - Rapid movement of a large quantity of materials (wood and sediment) down a stream channel during storms or floods. This generally occurs in smaller streams and results in scouring of streambed.

Density Management - Cutting of trees for the primary purpose of widening their spacing so that growth of remaining trees can be accelerated. Density management harvest can also be used to improve forest health, to open the forest canopy, or to accelerate the attainment of old growth characteristics if maintenance or restoration of biological diversity is the objective.

Departure (from even flow) - A timber sale level which deviates from sustainable sale levels through a planned temporary increase or decrease in the PSQ. Must be economically and biologically justified.

Designated Area - An area identified in the Oregon Smoke Management Plan as a principal population center requiring protection under state air quality laws or regulations.

Designated Conservation Area - A contiguous area of habitat to be managed and conserved for spotted owls as described in the U.S. Fish and Wildlife Service's Final Draft Recovery Plan for the Northern Spotted Owl.

Developed Recreation Site - A site developed with permanent facilities designed to accommodate recreation use.

Diameter at Breast Height (DBH) - The diameter of a tree 4.5 feet above the ground on the uphill side of the tree.

Dispersed Recreation - Outdoor recreation in which visitors are diffused over relatively large areas. Where facilities or developments are provided, they are primarily for access and protection of the environment rather than comfort or convenience of the user.

District Defined Reserves - Areas designated for the protection of specific resources, flora and fauna, and other values. These areas are not included in other land use allocations nor in the calculation of the PSQ.

Domestic Water Supply - Water used for human consumption.

Dynamic Stability - A characteristic of healthy forests in which the total ecosystem remains stable and resilient over time, but which remains dynamic in that its internal structure, arrangement, and species composition are constantly changing.

Early Seral Stage - The period from disturbance to crown closure of conifer stands, usually occurring from 0-15 years. Grass, herbs, or brush are plentiful.

Ecological Forestry - A set of forest management concepts that seek to maintain or recreate timber stand and landscape biological diversity. Also termed "New Perspectives", "New Forestry", and "Sustainable Forestry".

Ecological Health - The condition of an ecosystem in which processes and functions are adequate to maintain diversity of biotic communities commensurate with those initially found there.

Ecological Site - Land with specific potential natural communities and specific physical site characteristics differing from other land in its ability to produce vegetation and respond to management.

Economically Feasible - Having costs and revenues with a present net value greater than zero.

Economically Marginal Lands - Lower site or isolated parcels of lands identified as not permitting economically viable management using conventional logging and management strategies, but capable of contributing to local economies if management was subsidized or higher stumpage values could be obtained.

Ecosystem - An interacting natural system including living organisms and the nonliving environment. Ecosystems may vary in size. For example, the community of microorganisms in water, the lake which contains the water, the watershed the lake resides in, and the mountain range containing the watershed.

Ecosystem Diversity - The variety of species and ecological processes that occur in different physical settings.

Ecosystem Management - The management of lands and their resources to meet objectives based on their whole ecosystem function rather than on their character in isolation. Management objectives blend long-term needs of people and environmental values in such a way that the lands will support diverse, healthy, productive and sustainable ecosystems.

Ecosystem Resiliency - The ability of an ecosystem to absorb stress or change without significant loss of function.

Ecotone - A transition zone between two plant communities that usually contain some of the ecological features of each of the two associations but with structural and functional features of its own.

Edge Effect - An ecologically biological effect which occurs in the transition zone where two plant communities or successional stages meet and mix.

Effective Old Growth Habitat - Old growth forest largely unmodified by external environmental influences (e.g., wind, temperature, and encroachment of nonresident species) from nearby, younger forest stands. Also referred to as interior habitat. For analysis purposes, assumed to be at least 400 feet from an edge with an adjacent stand younger than age class 70.

Eligible River - A river or river segment found, through interdisciplinary team and in some cases interagency review, to meet Wild and Scenic River Act criteria of being free-flowing and possessing one or more outstandingly remarkable values.

Endangered Species - Any species defined through the Endangered Species Act as being in danger of extinction throughout all or a significant portion of its range and published in the Federal Register.

Environmental Assessment (EA) - A systematic analysis of site-specific BLM activities used to determine whether such activities have a significant effect on the quality of the human environment and whether a formal environmental impact statement is required; and to aid an agency's compliance with NEPA when no EIS is necessary.

Environmental Impact - The positive or negative effect of any action upon a given area or resource.

Environmental Impact Statement (EIS) - A formal document to be filed with the Environmental Protection Agency that considers significant environmental impacts expected from implementation of a major federal action.

Ephemeral Streams - Streams that contain running water only sporadically, such as during and following storm events.

Established Stand - A reforestation unit of suitable trees which are past the time when considerable juvenile mortality occurs. The unit is no longer in need of measures to ensure survival but is evaluated for measures to enhance growth.

Even-Aged Management - A silvicultural system which creates forest stands that are primarily of a single age or limited range of ages.

Existing Stand Condition (ESC) - An artificial classification that groups forest stands with similar management potential into categories matched to tables expressing yield at various stand ages under various combinations of silvicultural treatment.

Extensive Recreation Management Areas (ERMAs) - All BLM-administered lands outside Special Recreation Management Areas. These areas may include developed and primitive recreation sites with minimal facilities.

Forest Canopy - The cover of branches and foliage formed collectively by the crowns of adjacent trees and other woody growth.

Forest Health - The ability of forest ecosystems to remain productive, resilient, and stable over time and to withstand the effects of periodic natural or human-caused stresses such as drought, insect attack, disease, climatic changes, flood, resource management practices and resource demands.

Forestland - Land that is now, or is capable of becoming, at least l0 percent stocked with forest trees and has not been developed for nontimber use.

Forest Succession - The orderly process of change in a forest as one plant community or stand condition is replaced by another evolving towards the climax type of vegetation.

Fragile Nonsuitable - A timber production capability classification indicating forestland having fragile conditions, which if harvested, would result in reduced future productivity even if special harvest or restrictive measures are applied. These fragile conditions are related to soils, geologic structure, topography, and ground water.

Full Log Suspension - Suspension of the entire log above the ground during yarding operations.

General Forest Management Area - Forestland managed on a regeneration harvest cycle of 70-110 years. A biological legacy of six to eight green trees per acre would be retained to assure forest health. Commercial thinning would be applied where practicable and where research indicates there would be gains in timber production.

Genetic Diversity - The variety within populations of a species.

Green Tree Retention - A stand management practice in which live trees as well as snags and large down wood are left as biological legacies within harvest units to provide habitat components over the next management cycle.

> High Level - A regeneration harvest designed to retain the highest level of live trees possible while still providing enough disturbance to allow regeneration and growth of the naturally occurring mixture of tree species. Such harvest should allow for the regeneration of intolerant and tolerant species. Harvest design would also retain cover and structural features necessary to provide foraging and dispersal habitat for mature and old growth dependant species.
>
> Low Level - A regeneration harvest designed to retain only enough green trees and other structural components (snag, coarse woody debris, etc.) to result in the development of stands that meet old growth definitions within 100 to 120 years after harvest entry, considering overstory mortality.

Gross Yarding - Removal of all woody material of specified size from a logging unit to a landing.

Group Resource Unit (GRU) - A term used in TRIM-PLUS for each collection of current and future management instructions and data sources for the Basic Resource Units which are proposed to be managed to meet a particular set of management objectives.

Habitat Diversity - The number of different types of habitat within a given area.

Habitat Fragmentation - The breaking up of habitat into discrete islands through modification or conversion of habitat by management activities.

Habitat Management Plan - See Activity Plan.

Hardwood Site - A forest site occupied by hardwoods that is unsuitable for the production of conifer species.

Hazardous Materials - Anything that poses a substantive present or potential hazard to human health or the environment when improperly treated, stored, transported, disposed of, or otherwise managed.

Hiding Cover - Generally, any vegetation used by wildlife for security or to escape from danger. More specifically, any vegetation capable of providing concealment (e.g., hiding 90 percent of an animal) from human view at a distance of 200 feet or less.

Historic Site - A cultural resource resulting from activities or events dating to the historic period (generally post AD l830 in western Oregon).

Home Range - The area an animal traverses in the scope of normal activities; not to be confused with territory which is the area an animal defends.

Hyporheic Zone - The area under the stream channel and floodplain that contributes to the stream.

Impact - A spatial or temporal change in the environment caused by human activity.

Improved Seed - Seed originated from a seed orchard or selected tree(s) whose genetic superiority in one or more characters important to forestry has been proven by tests conducted in specific environments.

Infiltration (soil) - The movement of water through the soil surface into the soil.

Instant Study Area - A natural area formally identified by BLM for accelerated wilderness review by notice published before October 21, 1975.

Intact Old Growth Habitat - Older forest types that have not been entered for logging or are lightly entered such that structural and functional characteristics of the forest are essentially unchanged, except in relation to the size of the habitat island. Typically, forests of coniferous series with crown closure above 70 percent. Also includes low site lands lacking the ecological potential to produce older forest habitat characteristics.

Integrated Pest Management (IPM) - A systematic approach that uses a variety of techniques to reduce pest damage or unwanted vegetation to tolerable levels. IPM techniques may include natural predators and parasites, genetically resistant hosts, environmental modifications, and when necessary and appropriate, chemical pesticides or herbicides.

Integrated Vegetation Management - See Integrated Pest Management.

Intensively Managed Timber Stands - Forest stands managed to obtain a high level of timber volume or quality through investment in growth enhancing practices, such as precommercial thinning, commercial thinning, and fertilization. Not to be confused with the allocations of "lands available for intensive management of forest products".

Intensive Forest Management Practices - The growth enhancing practices of release, precommercial thinning, commercial thinning, and fertilization designed to obtain a high level of timber volume or quality.

Intermittent Stream - Any nonpermanent flowing drainage feature having a definable channel and evidence of scour or deposition. This includes what are sometimes referred to as ephemeral streams if they meet these two criteria.

Inventory River - A potential wild, scenic, or recreational river identified in the 1982 National Rivers Inventory (NRI) published by the National Park Service.

Irreversible or Irretrievable Commitment of Resources - Effect of an action or inaction which cannot be reversed within a reasonable time.

Issue - A matter of controversy or dispute over resource management activities that is well defined or topically discrete. Addressed in the design of planning alternatives.

Land Tenure Zones -

> Zone 1 includes areas currently identified as having high public resource values, and other efficiently managed lands. The natural resource values may require protection by federal law, Executive Order or policy. These lands may have other values or natural systems which merit long-term public ownership. They do not meet the criteria for sale under the Federal Land Policy Management Act of 1976 (FLPMA) Section 203(a) and would generally be retained in public ownership.
>
> Zone 2 includes lands that meet criteria for exchange because they form discontinuous ownership patterns, are relatively inefficient to manage, and may not be accessible to the general public. These BLM-administered lands may be blocked up in exchange for other lands in Zones 1 or 2, transferred to other public agencies, or given some form of cooperative management. These lands would not be sold under FLPMA Section 203(a).
>
> Zone 3 includes lands that are scattered and isolated with no known unique natural resource values. Zone 3 lands would be available for use in exchanges for private in holdings in Zone 1 (high priority) or Zone 2 (moderate priority). They are also potentially suitable for disposal through sale under FLPMA Section 203(a) if important recreation, wildlife, watershed, threatened or endangered species habitat and/or cultural values are not identified during disposal clearance reviews and no viable exchange proposals for them can be identified. Zone 3 lands would also be available for transfer to another agency or to local governments as needed, to accommodate community expansion and other public purposes.

Land Use Allocations - Allocations which define allowable uses/activities, restricted uses/activities, and prohibited uses/activities. They may be expressed in terms of area such as acres or miles etc. Each allocation is associated with a specific management objective.

Landing - Any place on or adjacent to the logging site where logs are assembled for further transport.

Landscape - A heterogeneous land area with interacting ecosystems that are repeated in similar form throughout.

Landscape Diversity - The size, shape, and connectivity of different ecosystems across a large area.

Landscape Features - The land and water form, vegetation, and structures that compose the characteristic landscape.

Landscape Grain - The smallest level of detail used to describe spatial resolution in landscape ecology.

Landscape Management - The application of ecosystem management practices to the specific area affected by the PRMP.

Late Seral Stage - See Seral Stages.

Late-Successional Forests - Forest seral stages which include mature and old growth age classes.

Late-Successional Reserve - A forest in its mature and/or old growth stages that has been reserved.

Leasable Minerals - Minerals that may be leased to private interests by the federal government. Includes oil, gas, geothermal resources, and coal.

Locatable Minerals - Minerals subject to exploration, development, and disposal by staking mining claims as authorized by the Mining Law of l872 (as amended). This includes valuable deposits of gold, silver, and other uncommon minerals not subject to lease or sale.

Log Decomposition Class - Any of five stages of deterioration of logs in the forest; stages range from essentially sound (class 1) to almost total decomposition (class 5).

Long Term - The period starting l0 years following implementation of the Resource Management Plan. For most analyses, long-term impacts are defined as those existing 100 years after implementation.

Long Term Soil Productivity - The capability of soil to sustain inherent, natural growth potential of plants and plant communities over time.

Long Term Sustained Yield - Estimated timber harvest that can be maintained indefinitely once all stands have been converted to a managed state under a specific management intensity.

Lumber and Wood Products, Except Furniture - An industrial classification which includes logging contractors engaged in cutting timber and pulpwoods; merchant sawmills, lath mills, shingle mills, planing mills, plywood mills, and veneer mills engaged in producing lumber and wood basic materials; and establishments engaged in manufacturing finished articles made entirely or mainly of wood or wood substitutes. Certain types of establishments producing wood products are classified elsewhere (e.g., furniture and office and store fixtures are in a different classification).

Major Plant Grouping - An aggregation of plant associations with similar management potential and with the same dominant late seral conifer species and the same major early seral species. Late seral rather than climax species are used because late seral species are usually present rather than climax communities and because most old growth plant communities on BLM-administered lands are made up of late seral species in the upper canopy rather than climax species.

Management Actions/Direction - Measures planned to achieve the stated objective(s).

Management Activity - An activity undertaken for the purpose of harvesting, traversing, transporting, protecting, changing, replenishing, or otherwise using resources.

Management Framework Plan (MFP) - A land use plan that established coordinated land use allocations for all resource and support activities for a specific land area within a BLM district. It established objectives and constraints for each resource and support activity and provided data for consideration in program planning. This process has been replaced by the Resource Management Planning process.

Management Intensity (MI) - An expression of a potential type of management for a Group Resource Unit in TRIM-PLUS expressed as a yield table.

Mass Movement - The downslope movement of earth caused by gravity. Includes but is not limited to landslides, rock falls, debris avalanches, and creep. It does not include surface erosion.

Matrix Lands - Federal land outside of reserves and special management areas that will be available for timber harvest at varying levels.

Mature Seral Stage - See Seral Stages.

Micro-Storms - A micro-computer database system providing background information and recommended treatment for each operations inventory unit.

Mid-Seral Stage - See Seral Stages

Mineral Estate - The ownership of the minerals at or beneath the surface of the land.

Mineral Potential Classification System - Method for assessing the potential for the presence of a concentration of one or more energy and/or mineral resources. The three categories are:

> High. The geologic environment, the inferred geologic processes, the reported occurrences and/or valid geochemical/geophysical anomaly, and the known mineral production indicate high potential for the occurrence and accumulation of mineral resources.
>
> Moderate. The geologic environment, the inferred geologic processes, and the reported mineral occurrences or valid geochem/geophysical anomaly indicate moderate potential for the occurrence and accumulation of minerals.
>
> Low. The geologic environment and the inferred geologic processes indicate low potential for the accumulation of mineral resources.

Minimum Harvest Age - The lowest age of a forest stand to be scheduled for final harvest.

Minimum Stocking - Reforestation level lower than target stocking. Does not achieve full site occupancy in young stands but is capable of achieving optimal final harvest yield and reduced commercial thinning yield.

Minimum Streamflow - The quantity of water needed to maintain the existing and planned in-place uses of water in or along a stream channel or other water body and to maintain the natural character of the aquatic system and its dependent systems.

Mining Claims - Portions of public lands claimed for possession of locatable mineral deposits by locating and recording under established rules and pursuant to the 1872 Mining Law.

Mitigating Measures - Modifications of actions which (a) avoid impacts by not taking a certain action or parts of an action; (b) minimize impacts by limiting the degree or magnitude of the action and its implementation; (c) rectify impacts by repairing, rehabilitating, or restoring the affected environment; (d) reduce or eliminate impacts over time by preservation and maintenance operations during the life of the action; or (e) compensate for impacts by replacing or providing substitute resources or environments.

Monitoring - The process of collecting information to evaluate if objectives and anticipated or assumed results of a management plan are being realized or if implementation is proceeding as planned.

Mortality Salvage - The harvest of dead and dying trees.

Multi-aged Stand - A forest stand which has more than one distinct age class arising from specific disturbance and regeneration events at various times. These stands normally will have multi-layered structure.

Multi-layered Canopy - Forest stands with two or more distinct tree layers in the canopy; also called multi-storied stands.

Multiple Use - Management of the public lands and their various resource values so they are utilized in the combination that will best meet the present and future needs of the American people; making the most judicious use of the land for some or all of these resources or related services over areas large enough to provide sufficient latitude for periodic adjustments in use to conform to changing needs and conditions; the use of some land for less than all of the resources; a combination of balanced and diverse resource uses that takes into account the long-term needs of future generations for renewable and nonrenewable resources, including but not limited to recreation, range, timber, minerals, watershed, wildlife and fish, and natural scenic, scientific, and historical values; and harmonious and coordinated management of the various resources without permanent impairment of the productivity of the land and the quality of the environment with consideration being given to the relative values of the resources and not necessarily to the combination of uses that will give the greatest economic return or the greatest unit output.

Mycorrhizal Fungi - Fungi with a symbiotic relationship with the roots of certain plants.

National Ambient Air Quality Standards (NAAQS) - Standards designed to protect public health and welfare while allowing for adequate margin of safety. For particulate matter less than l0 microns in size (PM 10), the standard for average annual is 50 micrograms per cubic meter and the 24-hour average annual standard is l50 micrograms per cubic meter neither to be exceeded more than once per year.

National Register of Historic Places - A formal list established by the National Historic Preservation Act of l966 of cultural resources worthy of preservation. The Register is maintained by the National Park

Service, and lists archaeological, historic, and architectural properties.

Neotropical Migrants - A wide variety of bird species, which breed in temperate North America but migrate to tropical habitats in Central and South America during winter.

Nonattainment - Failure of a geographical area to attain or maintain compliance with ambient air quality standards.

Nonattainment Area - A geographical area that has failed to attain or maintain compliance with air quality standards. Nonattainment area boundaries are commonly the same as city, standard metropolitan statistical area or county boundaries.

Nonchargeable Volume - Timber harvest not included in the allowable sale quantity calculations.

Noncommercial Forestland - Land incapable of yielding at least 20 cubic feet of wood per acre per year of commercial species; or land that is capable of producing only noncommercial tree species.

Noncommercial Tree Species - Minor conifer and hardwood species whose yields are not reflected in the commercial conifer forestland PSQ. Some species may be managed and sold under a suitable woodland PSQ, and therefore, may be commercial as a woodland species.

Nonforestland - Land developed for nontimber uses, or land incapable of being l0 percent stocked with forest trees.

Nongame Wildlife - All wild vertebrate and invertebrate animals not subject to sport hunting.

Nonpoint Source Pollution - Water pollution that does not result from a discharge at a specific, single location (such as a single pipe) but generally results from land runoff, precipitation, atmospheric deposition or percolation, and normally is associated with agricultural, silvicultural and urban runoff, runoff from construction activities, etc. Such pollution results in the human-made or human-induced alteration of the chemical, physical, biological, radiological integrity of water.

Nonsuitable Commercial Forestland - Sites that would take longer than 15 years to meet or exceed minimum stocking levels of commercial species. Further classified as suitable woodland.

Nonsuitable Woodland - All fragile nonsuitable forestland.

Noxious Plant - A plant specified by law as being especially undesirable, troublesome, and difficult to control.

Noxious Weed - See Noxious Plant.

Nutrient Cycling - Circulation or exchange of elements such as nitrogen and carbon between nonliving and living portions of the environment. Includes all mineral and nutrient cycles involving mammals and vegetation.

Nutrient Depletion - Detrimental changes on a site in the total amount of nutrients and/or their rates of input, uptake, release, movement, transformation, or export.

O&C Lands - Public lands granted to the Oregon and California Railroad Company and subsequently revested to the United States.

Objectives - Expressions of what are the desired end results of management efforts.

Obligate Species - A plant or animal that occurs only in a narrowly defined habitat such as tree cavity, rock cave, or wet meadow.

Off-Highway Vehicle - Any motorized track or wheeled vehicle designed for cross country travel over natural terrain. The term "Off-Highway Vehicle" will be used in place of the term "Off-Road Vehicle" to comply with the purposes of Executive Orders 11644 and 11989. The definition for both terms is the same.

Old Growth Conifer Stand - Older forests occurring on western hemlock, mixed conifer, or mixed evergreen sites that differ significantly from younger forests in structure, ecological function, and species composition. Old growth characteristics begin to appear in unmanaged forests at 175-250 years of age. These characteristics include (a) a patchy, multi-layered canopy with trees of several age classes; (b) the presence of large living trees; (c) the presence of larger standing dead trees (snags) and down woody debris; and (d) the presence of species and functional processes which are representative of the potential natural community.

For purposes of inventory, old growth stands on BLM-administered lands are only identified if they are at least 10 percent stocked with trees of 200 years or older and are 10 acres or more in size. For purposes of habitat or biological diversity, the BLM uses the appropriate minimum and average definitions provided by Pacific Northwest Experiment Station publications 447 and GTR-285. This definition is summarized from the 1986 interim definitions of the Old Growth Definitions Task Group.

Old Growth Seral Stage - See Seral Stages.

Old Growth-Dependent Species - An animal species so adapted that it can exist only in old growth forests.

Operations Inventory (OI) - An intensive, site-specific forest inventory of forest stand location, size, silvicultural needs, and recommended treatment based on individual stand conditions and productivity.

Operations Inventory Unit - An aggregation of trees occupying an area that is sufficiently uniform in composition, age, arrangement, and condition to be distinguishable from vegetation on adjoining areas.

Optimal Cover - For elk, cover used to hide from predators and avoid disturbances, including man. It consists of a forest stand with four layers and an overstory canopy that can intercept and hold a substantial amount of snow, yet has dispersed, small openings. It is generally achieved when the dominant trees average 21 inches dbh or greater and have 70 percent or greater crown closure.

Outstanding Natural Area (ONA) - An area that contains unusual natural characteristics and is managed primarily for educational and recreational purposes.

Outstandingly Remarkable Values (ORVs) - Values among those listed in Section 1 (b) of the Wild and Scenic Rivers Act: "scenic, recreational, geological, fish and wildlife, historical, cultural, or other similar values ...". Other similar values that may be considered include ecological, biological or botanical, paleontological, hydrological, scientific or research.

Overstory Removal - The final stage of cutting where the remaining overstory trees are removed to allow the understory to grow. Overstory removal is generally accomplished three to five years after reforestation and when adequate stocking has been achieved.

Paper and Allied Products - An industrial classification which includes establishments primarily engaged in the manufacture of pulps from wood and other cellulose fibers and from rags; the manufacture of paper and paperboard; and the manufacture of paper and paperboard into converted products, such as paper coated off the paper machine, paper bags, paper boxes, and envelopes.

Partial Cutting - Removal of selected trees from a forest stand.

Partial Log Suspension - During yarding operations, suspension of one end of the log above the ground.

Particulates - Finely divided solid or liquid (other than water) particles in the air.

Peak Flow - The highest amount of stream or river flow occurring in a year or from a single storm event.

Perennial Stream - A stream that has running water on a year-round basis under normal climatic conditions.

Personal Income - The income received by all individuals in the economy from all sources. Made up of wages and salaries, proprietors income, rental income, dividends, personal interest income, and the difference between transfer payments (payouts) and personal contributions for social insurance.

Plan Amendment - A change in the terms, conditions, or decisions of a resource management plan.

Plan Maintenance - Any documented minor change that interprets, clarifies, or refines a decision within a resource management plan but does not change the scope or conditions of that decision.

Plan Revision - A new resource management plan prepared by following all steps required by the regulations for preparing an original resource management plan.

Planning Area - All of the lands within the BLM management boundary addressed in a BLM resource management plan; however, BLM planning decisions apply only to BLM-administered lands and mineral estate.

Planning Issue - See Issue.

Plant Association - A plant community type based on land management potential, successional patterns, and species composition.

Plant Community - An association of plants of various species found growing together in different areas with similar site characteristics.

Plantation Maintenance- Actions in an unestablished forest stand to promote the survival of desired crop trees.

Plantation Release - All activities associated with promoting the dominance and/or growth of desired tree species within an established forest stand.

Pool/Riffle Ratio - The ratio of surface area or length of pools to the surface area or length of riffles in a given stream reach; frequently expressed as the relative percentage of each category. Used to describe fish habitat rearing quality.

Potential ACEC - An area of BLM-administered land that meets the relevance and importance criteria for ACEC designation, as follows:

> (1) Relevance. There shall be present a significant historic, cultural, or scenic value; a fish or wildlife resource; or other natural system or process; or natural hazard.
>
> (2) Importance. The above described value, resource, system, process, or hazard shall have substantial significance and values. This generally requires qualities of more than local significance and special worth, consequence, meaning, distinctiveness, or cause for concern. A natural hazard can be important if it is a significant threat to human life or property.

Potential Natural Community - The community of plants and wild animals that would become established if all successional sequences were completed without interference by man under present environmental conditions. For forest communities, the potential natural community is an old growth conifer stand.

Precommercial Thinning - The practice of removing some of the trees less than merchantable size from a stand so that remaining trees will grow faster.

Prescribed Fire - A fire burning under specified conditions that will accomplish certain planned objectives.

Prevention Strategy(ies) - The amelioration of conditions that cause or favor the presence of competing or unwanted vegetation.

Priority Animal Taxa - Species or subspecies having special significance for management. They include endangered, threatened and special status species; species of high economic or recreation value; and species of significant public interest.

Priority Habitats - Aquatic, wetland and riparian habitats, and habitats of priority animal taxa.

Probable Sale Quantity (PSQ) - Probable sale quantity estimates the allowable harvest levels for the various alternatives that could be maintained without decline over the long term if the schedule of harvests and regeneration were followed. "Allowable" was changed to "probable" to reflect uncertainty in the calculations for some alternatives. Probable sale quantity is otherwise comparable to allowable sale quantity (ASQ). However, probable sale quantity does not reflect a commitment to a specific cut level. Probable sale quantity includes only scheduled or regulated yields and does not include "other wood" or volume of cull and other products that are not normally part of allowable sale quantity calculations.

Progeny Test Site - A test area for evaluating parent seed trees by comparing the growth of their offspring seedlings.

Proposed Threatened or Endangered Species - Plant or animal species proposed by the U.S. Fish & Wildlife Service to be biologically appropriate for listing as threatened or endangered and published in the Federal Register. It is not a final designation.

Public Domain Lands - Original holdings of the United States never granted or conveyed to other jurisdictions, or reacquired by exchange for other public domain lands.

Public Water System - A system providing piped water for public consumption. Such a system has at least 15 service connections or regularly serves at least 25 individuals.

Raptor - Any of the birds of prey, which includes eagles, hawks, falcons, and owls.

Rearing Habitat - Areas in rivers or streams where juvenile salmon and trout find food and shelter to live and grow.

Recovery Plan - A plan for the conservation and survival of an endangered species or a threatened species listed under the Endangered Species Act to improve the status of the species to make continued listing unnecessary.

Recreational River - See Wild and Scenic River System.

Reforestation - The natural or artificial restocking of an area with forest trees; most commonly used in reference to artificial stocking.

Regeneration Harvest - Timber harvest conducted with the partial objective of opening a forest stand to the point where favored tree species will be reestablished.

Regeneration Period - The time it takes to reforest an area to adequate stocking following a timber sale.

Regional Ecosystem Office (REO) - The main function of this office is to provide staff work and support to the Regional Interagency Executive Committee so the standards and guidelines in the forest management plan can be successfully implemented.

Regional Interagency Executive Committee (RIEC) - This group serves as the senior regional entity to assure the prompt, coordinated and successful implementation of the forest management plan standards and guidelines at the regional level.

Regulated Forest - A forest which comprises an even distribution of age classes or tree sizes when the growth equals the cut (at the highest level sustainable) and when the level of growing stock remains relatively constant.

Representative 10-Year Timber Management Scenario - A set of assumed timber harvest units, road locations, average annual levels of associated practices, and intensive management practices for the decade of the expected life of the plan.

Research Natural Area (RNA) - An area that contains natural resource values of scientific interest and is managed primarily for research and educational purposes.

Reserved Federal Mineral Estate - Land on which the federal government has ownership of minerals but the surface estate is private or other nonfederal ownership.

Reserved Pair Areas - Areas of suitable habitat identified for territorial single owls and owl pairs. The size of these areas varies by province, based on the data for the owls in the area. These areas are designated where habitat and owl populations do not meet the criteria for Designated Conservation Areas.

Residual Habitat Area - An area about 100 acres in size of nesting, roosting and foraging habitat encompassing the known activity center for a pair of owls or a territorial single owl.

Resource Management Plan (RMP) - A land use plan prepared by the BLM under current regulations in accordance with the Federal Land Policy and Management Act.

Respending Effects - The jobs and income generated by the purchase of goods and services by businesses or employees in the sector(s) being examined. Example: Purchases of legal services by wood products companies and their employees is a respending effect that creates jobs and income for lawyers.

Restoration and Retention Blocks - Ecological reserves managed to restore or retain old growth communities and respective plant communities. (Applied in Alternative C only).

Right-of-Way - A permit or an easement that authorizes the use of public lands for specified purposes, such as pipelines, roads, telephone lines, electric lines, reservoirs, and the lands covered by such an easement or permit.

Riparian Reserves - Designated riparian areas found outside Late-Successional Reserves.

Riparian Zone - Those terrestrial areas where the vegetation complex and microclimate conditions are products of the combined presence and influence of perennial and/or intermittent water, associated high water tables and soils which exhibit some wetness characteristics. Normally used to refer to the zone within which plants grow rooted in the water table of these rivers, streams, lakes, ponds, reservoirs, springs, marshes, seeps, bogs and wet meadows.

Ripping - The process of breaking up or loosening compacted soil to assure better penetration of roots of young tree seedlings.

Rotation - The planned number of years between establishment of a forest stand and its regeneration harvest.

Rural Interface Areas - Areas where BLM-administered lands are adjacent to or intermingled with privately owned lands zoned for 1 to 20-acre lots or that already have residential development.

Saleable Minerals - High volume, low value mineral resources including common varieties of rock, clay, decorative stone, sand, and gravel.

Sanitation-Salvage Cuttings - Combination of sanitation and salvage cuttings. In sanitation cuts trees either killed or injured by fire, insects, disease, etc. are removed for the purpose of preventing the spread of insect or disease. Salvage cuts remove trees that are either killed or severely injured before merchantable material becomes unmerchantable.

Scarification - Mechanical removal of competing vegetation or interfering debris prior to planting.

Scenic Quality - The relative worth of a landscape from a visual perception point of view.

Scenic River - See Wild and Scenic River System.

Scribner Short Log - A log measurement rule constructed from diagrams which shows the number of 1-inch boards that can be drawn in a circle representing the small end of a 16-foot-long log, assumes a 1/4-inch saw kerf groove, makes a liberal allowance for slabs, and disregards log taper.

Sediment Yield - The quantity of soil, rock particles, organic matter or other debris transported through a cross-section of stream in a given period of time. Measured in dry weight or by volume. Consists of suspended sediment and bedload.

Seed Tree Cutting Method - An even-aged reproductive cutting method in which all mature timber from an area is harvested in one entry except for a small number of trees left as a seed source for the harvested area.

Seed Orchard - A plantation of clones or seedlings from selected trees isolated to reduce pollination from outside sources, weeded of undesirables, and cultured for early and abundant production of seed.

Selection Cutting - A method of uneven-aged management involving the harvesting of single trees from stands (single-tree selection) or in groups (group selection) without harvesting the entire stand at any one time.

Sensitivity Analysis - A process of examining specific trade-offs that would result from making changes in single elements of a plan alternative.

Sensitivity Levels - Measures (e.g., high, medium, and low) of public concern for the maintenance of scenic quality.

Seral Stages - The series of relatively transitory plant communities that develop during ecological succession from bare ground to the climax stage. There are five stages:

> Early Seral Stage - The period from disturbance to the time when crowns close and conifers or hardwoods dominate the site. Under the current forest management regime, the duration is approximately 0 to 10 years. This stage may be dominated by grasses and forbs or by sprouting brush or hardwoods. Conifers develop slowly at first and gradually replace grasses, forbs, or brush as the dominant vegetation. Forage may be present; hiding or thermal cover may not be present except in rapidly sprouting brush communities.

Mid-Seral Stage - The mid-seral stage occurs from crown closure to the time when conifers would begin to die from competition; approximately age 10 to 40. Stands are dense and dominated by conifers, hardwoods, or dense brush. Grass, forbs, and herbaceous vegetation decrease. Hiding cover for big game is usually present.

Late Seral Stage - Late seral stage occurs when conifers would begin to die from competition to the time when stand growth slows; approximately age 41 to 100. Forest stands are dominated by conifers or hardwoods; canopy closure often approaches 100 percent. Stand diversity is minimal; conifer mortality rates and snag formation are rapid. Big game hiding and thermal cover is present. Forage and understory vegetation is minimal except in understocked stands or in meadow inclusions.

Mature Seral Stage - This stage exists from the point where stand growth slows to the time when the forest develops structural diversity; approximately age 101 to 200. Conifer and hardwood growth gradually decline. Developmental change slows. Larger trees increase significantly in size. Stand diversity gradually increases. Big game hiding cover, thermal cover, and some forage are present. With slowing growth, insect damage increases and stand breakup may begin on drier sites. Understory development is significant in response to openings in the canopy created by disease, insects, and windthrow. Vertical diversity increases. Larger snags are formed.

Old Growth - This stage constitutes the potential plant community capable of existing on a site given the frequency of natural disturbance events. For forest communities, this stage exists from approximately age 200 until when stand replacement occurs and secondary succession begins again. (Also see definitions of old-growth conifer stand and potential natural community.)

Shelterwood Cutting - A regeneration method under an even-aged silvicultural system. A portion of the mature stand is retained as a source of seed and/or protection during the period of regeneration. The mature stand is removed in two or more cuttings.

Shelterwood Retention - The practice of retaining trees left in a shelterwood regeneration harvest for varying period of time beyond that needed for seedling survival. Overstory trees are retained to protect visual quality or to protect understory conifers from frost. Most or all trees left in shelterwood retention harvests would eventually be removed when visual or other objectives are met by the understory alone. Also called an irregular shelterwood or modified shelterwood system.

Short Term - The period of time during which the RMP will be implemented; assumed to be 10 years.

Silvicultural Prescription - A professional plan for controlling the establishment, composition, constitution, and growth of forests.

Silvicultural System - A planned sequence of treatments over the entire life of a forest stand needed to meet management objectives.

Site Class - A measure of an area's relative capacity for producing timber or other vegetation.

Site Index - A measure of forest productivity expressed as the height of the tallest trees in a stand at an index age.

Site Preparation - Any action taken in conjunction with a reforestation effort (natural or artificial) to create an environment that is favorable for survival of suitable trees during the first growing season. This environment can be created by altering ground cover, soil or microsite conditions using biological, mechanical, or manual clearing, prescribed burns, herbicides or a combination of methods.

Skid Trail - A pathway created by dragging logs to a landing (gathering point).

Skyline Yarding - A cable yarding system using one of the cables to support a carriage from which logs are suspended and then pulled to a landing.

Slash - The branches, bark, tops, cull logs, and broken or uprooted trees left on the ground after logging.

Slope Failure - See Mass Movement.

Smoke Management - Conducting a prescribed fire under suitable fuel moisture and meteorological conditions with firing techniques that keep smoke impact on the environment within designated limits.

Smoke Management Program - A program designed to ensure that smoke impacts on air quality from agricultural or forestry burning operations are minimized that impacts do not exceed or significantly contribute to violations of air quality standards or visibility protection guidelines, and that necessary open burning can be accomplished to achieve land management goals.

Smoke Sensitive Area - An area identified by the Oregon Smoke Management Plan that may be negatively affected by smoke but is not classified as a designated area.

Snag - Any standing dead, partially-dead, or defective (cull) tree at least 10 inches in diameter at breast height (dbh) and at least 6 feet tall. A hard snag is composed primarily of sound wood, generally merchantable. A soft snag is composed primarily of wood in advanced stages of decay and deterioration, generally not merchantable.

Snag Dependent Species - Birds and animals dependent on snags for nesting, roosting, or foraging habitat.

Soil Compaction - An increase in bulk density (weight per unit volume) and a decrease in soil porosity resulting from applied loads, vibration, or pressure.

Soil Displacement - The removal and horizontal movement of soil from one place to another by mechanical forces such as a blade.

Soil Productivity - Capacity or suitability of a soil for establishment and growth of a specified crop or plant species, primarily through nutrient availability.

Soil Series - A group of soils developed from a particular type of parent material having naturally developed horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement of the profile.

Special Areas - Areas that may need special management. This may include management as an area of critical environmental concern (ACEC), research natural area (RNA), outstanding natural area (ONA), environmental education area, or other special category.

Special Forest Products - Firewood, shake bolts, mushrooms, ferns, floral greens, berries, mosses, bark, grasses etc., that could be harvested in accordance with the objectives and guidelines in the proposed resource management plan.

Special Habitat Features - Habitats of special importance due to their uniqueness or high value.

Special Recreation Management Area (SRMA) - An area where a commitment has been to provide specific recreation activity and experience opportunities. These areas usually require a high level of recreation investment and/or management. They include recreation sites but recreation sites alone do not constitute SRMAs.

Special Status Species - Plant or animal species falling in any of the following categories (see separate glossary definitions for each):

- Threatened or Endangered Species,
- Proposed Threatened or Endangered Species,
- Candidate Species,
- State Listed Species,
- Bureau-Sensitive Species, and
- Bureau-Assessment Species.

Species Diversity - The number, different kinds, and relative abundance of species.

Split Estate - An area of land where the surface is nonfederally owned and the subsurface mineral resources are federally owned or vice versa.

Spotted Owl Habitat Sites - Sites monitored by BLM for spotted owl occupancy during some or all of the years l985 through l988, in accordance with BLM's spotted owl monitoring guidelines. These sites are known to have been inhabited by spotted owls at some time in the last dozen years but not necessarily during the l985-l988 period.

Stand (Tree Stand) - An aggregation of trees occupying a specific area and sufficiently uniform in composition, age, arrangement, and condition so that it is distinguishable from the forest in adjoining areas.

Stand Conversion - A process in which vegetation that currently dominates a site is removed and is replaced with species that better meets timber management objectives. Typically, on sites that will support commercial conifers, vegetation such as hardwoods, grass, and shrubs are removed and are replaced with a mixture of commercial conifer species such as Douglas-fir, ponderosa pine, or other species.

Stand Density - An expression of the number and size of trees on a forest site. May be expressed in terms of numbers of trees per acre, basal area, stand density index, or relative density index.

Stand Density Index - A measure of stand density independent of site quality and age. From the stand density index, an approximate number of trees, of a chosen diameter, capable of being supported on an acre can be determined.

State Historic Preservation Officer - The state official authorized to act as a liaison to the Secretary of the Interior for purposes of implementing the National Historic Preservation Act of l966.

State Implementation Plan (SIP) - A state document, required by the Clean Air Act. It describes a comprehensive plan of action for achieving specified air quality objectives and standards for a particular locality or region within a specified time, as enforced by the state and approved by the Environmental Protection Agency.

State Listed Species - Plant or animal species listed by the State of Oregon as threatened or endangered pursuant to ORS 496.004, ORS 498.026, or ORS 564.040.

Statewide Comprehensive Outdoor Recreation Plan (SCORP) - A plan prepared by the state that describes and analyzes the organization and function of the outdoor recreation system of the state. The plan provides an analysis of the roles and responsibilities of major outdoor recreation suppliers; an analysis of demand, supply, and needs; issue discussions; an action program to address the issues; and a project selection process.

Stocked/Stocking - Related to the number and spacing of trees in a forest stand.

Strategic and Critical Minerals - Minerals that supply military, industrial and essential civilian needs of the United States during a national defense emergency. They are not found or produced in this country in sufficient quantities to meet such needs. Nickel, cobalt, and chromium are examples of such minerals that occur in western Oregon.

Stream Class - A system of stream classification established in the Oregon Forest Practices Act. Class I streams are those which are significant for: 1) domestic use, 2) angling, 3) water dependent recreation, and 4) spawning, rearing, or migration of anadromous or game fish. All other streams are Class II. Class II special protection streams are Class II streams that have a significant summertime cooling influence on downstream Class I waters, which are at or near a temperature at which production of anadromous or game fish is limited.

Stream Order - A hydrologic system of stream classification based on stream branching. Each small unbranched tributary is a first order stream. Two first order streams join to make a second order stream. Two second order streams join to form a third order stream and so forth.

Stream Reach - An individual first order stream or a segment of another stream that has beginning and ending points at a stream confluence. Reach end points are normally designated where a tributary confluence changes the channel character or order. Although reaches identified by BLM are variable in length, they normally have a range of 1/2 to 1-1/2 miles in length unless channel character, confluence distribution, or management considerations require variance.

Structural Diversity - Variety in a forest stand that results from layering or tiering of the canopy and the die-back, death and ultimate decay of trees. In aquatic habitats, the presence of a variety of structural features such as logs and boulders that create a variety of habitat.

Succession - A series of dynamic changes by which one group of organisms succeeds another through stages leading to potential natural community or climax. An example is the development of series of plant communities (called seral stages) following a major disturbance.

Suitable Commercial Forestland - Commercial forestland capable of sustained long-term timber production.

Suitable River - A river segment found, through administrative study by an appropriate agency, to meet the criteria for designation as a component of the National Wild and Scenic Rivers system, specified in Section 4(a) of the Wild and Scenic Rivers Act.

Suitable Woodland - Forestland occupied by minor conifer and hardwood species not considered in the commercial forestland PSQ determination and referred to as noncommercial species. These species may be considered commercial for fuelwood, etc. under woodland management. Also included are low site and nonsuitable commercial forestland. These lands must be biologically and environmentally capable of supporting a sustained yield of forest products.

Surface Erosion - The detachment and transport of soil particles by wind, water, or gravity. Surface erosion can occur as the loss of soil in a uniform layer (sheet erosion), in many rills, or by dry ravel.

Suspended Sediment - Sediment suspended in a fluid by the upward components of turbulent currents or by colloidal suspension.

Sustained Yield - The yield that a forest can produce continuously at a given intensity of management.

Sustained Yield Unit (SYU) - An administrative division for which probable sale quantity is calculated.

Target Stand Condition - A list of timber stand characteristics to be attained within a given time after harvest or other disturbance event through the use of prescribed silvicultural systems. Features that may be included are live trees species composition, number of trees per acre of a minimum diameter and/or age, type of forest canopy, number of snags per acre of a minimum diameter and height, and amounts of course woody debris available.

Target Stocking - The desirable number of well-spaced trees per acre at age of first commercial thinning.

Ten Percent Stocked - Stocking of tree seedlings and saplings (0.5 inches in diameter 4.5 feet above the ground) that are well distributed over the land and are more than 30 per acre in number. Or the stocking of trees larger than 5 inches in diameter with foliage that covers at least l0 percent of the land surface area.

Texture (soil) - The relative proportion of sand, silt, and clay in a soil grouped into standard classes and subclasses in the USDA Soil Survey Manual.

Thermal Cover - Cover used by animals to lessen the effects of weather. For elk, a stand of conifer trees that are 40 feet or more tall with an average crown closure of 70 percent or more. For deer, cover may include saplings, shrubs, or trees at least 5 feet tall with 75 percent crown closure.

Threatened Species - Any species defined through the Endangered Species Act as likely to become endangered within the foreseeable future throughout all or a significant portion of its range and published in the Federal Register.

Timber Management Plan - An activity plan that specifically addresses procedures related to the offering and sale of timber volume consistent with the approved probable sale quantity.

Timber Production Capability Classification (TPCC) - The process of partitioning forestland into major classes indicating relative suitability to produce timber on a sustained yield basis.

Total Suspended Particulates - All solid or semi-solid material found in the atmosphere.

Transportation System - Network of roads used to manage BLM-administered lands. Includes BLM controlled roads and some privately controlled roads. Does not include Oregon Department of Transportation, county, and municipal roads.

Travel Corridor - A route used by animals along a belt or band of suitable cover or habitat.

Understocked - The condition when a plantation of trees fails to meet the minimum requirements for number of well spaced trees per acre.

Undeveloped Recreation Site - A site that is used for intensive activities such as camping or picnicking but was not specifically developed for that purpose. The facilities are usually temporary in nature, designed to minimize resource damage and provide for short-term use. Although little or no investment may have been made by BLM at the site, BLM has a management commitment to periodically monitor and provide basic maintenance.

Uneven-Aged Management - A combination of actions that simultaneously maintains continuous tall forest cover, recurring regeneration of desirable species, and the orderly growth and development of trees through a range of diameter or age classes. Cutting methods that develop and maintain uneven-aged stands are single-tree selection and group selection.

Unique Ecosystems - Ecosystems embracing special habitat features such as beaches and dunes, talus slopes, meadows, and wetlands.

Unnecessary or Undue Degradation - Surface disturbance greater than what would normally result when an activity is being accomplished by a prudent operator in usual, customary, and proficient operations of similar character and taking into consideration the effects of operations on other resources and land uses, including those resources and uses outside the area of operations. Unnecessary and undue degradation may involve failure to initiate and complete reasonable mitigation measures including reclamation of the disturbed area, creation of a nuisance, or failure to comply with applicable environmental protection statues and regulations.

Utility Corridor - A linear strip of land identified for the present or future location of utility lines within its boundaries.

Viable Population - A wildlife or plant population that contains an adequate number of reproductive individuals to appropriately ensure the long-term existence of the species.

Viewshed - The landscape that can be directly seen from a viewpoint or along a transportation corridor.

Visibility Protection Plan - A plan that implements the requirements of the Clean Air Act by establishing programs for visibility monitoring; short- and long-term control strategies; and procedures for program review, coordination, and consultation.

Visual Resources - The visible physical features of a landscape.

Visual Resource Management (VRM) - The inventory and planning actions to identify visual values and establish objectives for managing those values and the management actions to achieve visual management objectives.

Visual Resource Management Classes - Categories assigned to public lands based on scenic quality, sensitivity level, and distance zones. There are four classes. Each class has an objective that prescribes the amount of modification allowed in the landscape.

Water Quality - The chemical, physical, and biological characteristics of water.

Water Yield - The quantity of water derived from a unit area of watershed.

Western Oregon Digital Data Base (WODDB) - A very high resolution (l"=400') geographic digital (computer) data base derived from aerial photography for BLM-administered lands in western Oregon.

Wetlands or Wetland Habitat - Those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include, but are not limited to, swamps, marshes, bogs, and similar areas.

Wet Meadows - Areas where grasses predominate. Normally waterlogged within a few inches of the ground surface.

Wild and Scenic River System - A national system of rivers or river segments that have been designated by Congress and the President as part of the National Wild and Scenic Rivers System (Public Law 90-542, 1968). Each designated river is classified as one of the following:

> Wild River - A river or section of a river free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. Designated wild as part of the National Wild and Scenic Rivers System.
>
> Scenic River - A river or section of a river free of impoundments, with shorelines or watersheds still largely primitive and undeveloped but accessible in places by roads. Designated scenic as part of the National Wild and Scenic Rivers System.
>
> Recreational River - A river or section of a river readily accessible by road or railroad, that may have some development along its shorelines, and that may have undergone some impoundment of diversion in the past. Designated recreational as part of the National Wild and Scenic Rivers System.

Wilderness Study Area (WSA) - A roadless area inventoried and found to be wilderness in character, having few human developments and providing outstanding opportunities for solitude and primitive recreation, as described in Section 603 of the Federal Land Policy and Management Act and in Section 2(c) of the Wilderness Act of l964.

Wildlife Tree - A live tree retained to become future snag habitat.

Wild River - See Wild and Scenic River System.

Windthrow - A tree or trees uprooted or felled by the wind.

Withdrawal - A designation that restricts or closes public lands from the operation of land or mineral disposal laws.

Woodland - Forestland producing trees not typically used as saw timber products and not included in calculation of the commercial forestland PSQ.

Yarding - The act or process of moving logs to a landing.

Yield Table - A table of timber volumes expected to be produced under a certain set of conditions.

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